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HOGTOWN CREEK GREENWAY

MASTER DEVELOPMENT & MANAGEMENT PLAN REPORT

URBAN AND REGIONAL PLANNING
UNIVERSITY OF FLORIDA

Prepared for:

CITY OF GAINESVILLE, FLORIDA

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Revised As Of
March, 1994

HOGTOWN CREEK GREENWAY

MASTER DEVELOPMENT
and
MANAGEMENT PLAN REPORT

As Approved In Concept By:

City of Gainesville
City Commission

July 7 & 26, 1993

As Approved By:

Alachua County
Board of County Commissioners

July 27, 1993

With Modifications As Requested By:

Florida Communities Trust

December 22, 1993

TABLE OF CONTENTS

Page No

INTRODUCTION 1

PROJECT PURPOSE 5

EXISTING CONDITIONS 7
- ENVIRONMENTAL AND ECOLOGICAL RESOURCES 7
 - TOPOGRAPHY 7
 - GEOLOGY, SOILS AND GROUND WATER 7
 - SURFACE WATER HYDROLOGY 10
 - FLORA WITHIN STUDY AREA 12
 - THREATENED SPECIES 17
 - INVASIVE OR NON-NATIVE VEGETATION 18
 - FAUNA WITHIN STUDY AREA 18
- CULTURAL RESOURCES 21
 - CULTURAL EVALUATION OF THE PROJECT STUDY AREA 21
 - Methodology 26
 - Preliminary Evaluation Results 26
 - Recommendations 27
 - CULTURAL AND ENVIRONMENTAL PROGRAMS 28
 - Ring Park 28
 - Loblolly Environmental Education Facility 28
 - Kanapaha Botanical Gardens 28
- MAN-MADE FACILITIES/LAND USE EVALUATION 28
 - POTENTIAL & KNOWN POLLUTION SITES/DEGRADED LANDS 29
 - Cabot Carbon/Koppers Superfund Site 29
 - Farmer's Mutual Exchange 29
 - Bailey's Branch/Gainesville Mall 29
 - Shands Swamp 29
 - Westgate Shopping Center Area 31
 - Sugarfoot Prairie 31
 - University of Florida Landfill 31
 - Interstate 75 31
 - Dam on Lake Kanapaha 31
 - Split Rock 31
 - Kanapaha Water Reclamation Plant 32

PROJECT GOALS 33
- ENVIRONMENTAL GOAL 33
- TRANSPORTATION GOAL 33
- RECREATION GOAL 33
- HEALTH AND FITNESS GOAL 33
- QUALITY OF LIFE GOAL 33
- PUBLIC ACCESS/PRIVACY GOAL 34
- SAFETY AND SECURITY GOAL 34
- EDUCATION GOAL 34
- OPERATIONS AND MANAGEMENT GOAL 34

FINANCIAL GOAL 34
ECONOMIC DEVELOPMENT GOAL 34
CULTURAL RESOURCE GOAL 34

PROPERTY ACQUISITION 35

RECOMMENDED GREENWAY FACILITIES 39
NW 23RD AVENUE, AT GAINESVILLE MALL, TO ELKS CLUB LODGE . 39
GHS TO ELKS CLUB LODGE VIA NW 23RD AVENUE 41
GAINESVILLE HIGH SCHOOL TO ALFRED A. RING PARK 41
ALFRED A. RING PARK 41
ELKS CLUB LODGE TO NW 22ND ST. VIA NW 23RD AVE. R.O.W. 41
NW 16TH AVENUE TO NW 8TH AVENUE 41
ALONG NW 8TH AVENUE TO NW 34TH STREET 47
NW 34TH ST. TO LOBLOLLY ENVIRONMENTAL ED. FACILITY 49
BLACK ACRES BIKE PATH 51
LOBLOLLY ENVIRONMENTAL ED. FACILITY TO WESTGATE S. C. 51
WESTGATE SHOPPING CENTER TO CREEKSIDE MALL 54
CREEKSIDE MALL TO NW 34TH ST. @ UNIV. OF FLORIDA 54
CREEKSIDE MALL TO GREEN ACRES PARK 57
GREEN ACRES PARK TO SUGARFOOT PRAIRIE 57
GREEN ACRES PARK TO OAKS MALL 57
SUGARFOOT PRAIRIE TO FOREST PARK 59
SW 20TH AVENUE TO I-75 61
SW 20TH AVENUE TO OAKS MALL 61
I-75 TO KANAPAHA BOTANICAL GARDENS 61
GREENWAY IMPROVEMENTS WEST OF KANAPAHA BOT. GARDENS.. 64
KANAPAHA BOT. GARDENS & WEST SIDE OF LAKE KANAPAHA 66
STAGECOACH ROAD TO SW 75TH STREET 66
ALONG TOWER ROAD TO ARCHER ROAD 66
SW 75TH STREET TO I-75 ALONG SW 24TH AVENUE 66

OTHER RECOMMENDED FACILITIES 69
GREENWAY SIGNAGE 69
LIGHTING OF GREENWAY FACILITIES 70
BATHROOM & POTABLE WATER FACILITIES 71
PICNIC, SCENIC VIEW SHED AND REST AREAS 71
USE OF RECYCLED WASTE MATERIALS 72

IMPACTS OF GREENWAY DEVELOPMENT 73
ENVIRONMENTAL IMPACTS 73
PROJECTIONS OF USE/LANDSCAPE CARRYING CAPACITY 73
INFLUENCES OF PROPER TRAIL TREAD DEVELOPMENT 76
IMPACTS ON ADJACENT PROPERTIES 76
BUFFERING AND SCREENING 77
MITIGATING VISUAL BLIGHT 77
PERMITS REQUIRED FOR GREENWAY DEVELOPMENT 78

ENVIRONMENTAL MONITORING PLAN 81
WATER QUALITY AND QUANTITY 82
SOIL MOISTURE, COMPACTION AND LOSS LEVELS 88
PLANTS: COMMUNITY STRUCTURE, COMPOSITION & DYNAMICS 88
MAMMALS: OCCURRENCES AND DENSITIES 89
BIRDS: OCCURRENCES, DENSITIES, NESTING & REPRODUCTION... 89
REPTILES, AMPHIBIANS, FISH AND OTHER ORGANISMS 90

FACILITY MANAGEMENT AND MAINTENANCE 91
FACILITY MAINTENANCE 91
LANDSCAPE RESTORATION 92
ASSIGNMENT OF MAINTENANCE RESPONSIBILITIES 94
GAINESVILLE NATURE OPERATIONS DIVISION 94
GAINESVILLE PARKS DIVISION 94
GAINESVILLE PUBLIC WORKS DEPARTMENT 94
VOLUNTEER TRAIL OFFICERS 95
ALACHUA COUNTY 95
FACILITY MAINTENANCE AND MANAGEMENT COSTS 95
DESCRIPTION OF MAINTENANCE/MANAGEMENT ACTIVITY 97

GREENWAY SAFETY AND SECURITY 98
GREENWAY HOURS OF OPERATION 99
GREENWAY USER RULES AND REGULATIONS 99
POLICE/PARK OFFICER PATROL & EMERGENCY RESPONSE 101
MAJOR ROADWAY CROSSINGS 101

RISK MANAGEMENT AND LIABILITY 104
POTENTIAL IMPACT ON MUNICIPAL INSURANCE 104

PILOT PROJECT DEVELOPMENT COSTS 105
POSSIBLE PILOT PROJECT FACILITIES 105
PILOT PROJECT COST ESTIMATES 106

SOURCES OF FUNDING FOR DEVELOPMENT 107
GREENSPACE TRUST FUND 107
STORMWATER UTILITY FUND 107
MUNICIPAL BOND ISSUE 107
SWAP/DONATION OF LAND 107
ALACHUA COUNTY FINANCIAL PARTICIPATION 108
INTERMODAL SURFACE TRANS. EFFICIENCY ACT (ISTEA) FUNDS ... 108
ADDITIONAL POTENTIAL FUNDING SOURCES 108

PHASING PLAN FOR IMPLEMENTATION 109
THE PILOT PROJECT 109
PHASE II DEVELOPMENT 109
PHASE III DEVELOPMENT 109
PHASE IV DEVELOPMENT 110

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APPENDIX A: ECOLOGICAL SURVEY & MANAGEMENT RECOMMENDATIONS

APPENDIX B: FLORIDA COMMUNITIES TRUST ANNUAL REPORTING PROCEDURES

APPENDIX C: INTERLOCAL AGREEMENT BETWEEN THE CITY OF GAINESVILLE & ALACHUA COUNTY

LIST OF TABLES

		Page No.
TABLE 1.	KEYNOTE SPECIES OR FEATURES	22
TABLE 2.	LISTED ARCHAEOLOGICAL SITES IN HOGTOWN CREEK GREENWAY	24
TABLE 3.	INTENSITY OF TRAIL USE	74
TABLE 4.	ENVIRONMENTAL SUITABILITY OF TRAIL USE WITHIN SENSITIVE ENVIRONMENTS	75
TABLE 5.	NORMAL MONTHLY RAINFALL DATA	83
TABLE 6.	AGENCIES AND INDIVIDUALS RESPONSIBLE FOR THE HOGTOWN CREEK GREENWAY SYSTEM	96
TABLE 7.	INTERSECTION ANALYSIS	103

LIST OF MAPS

		Page No.
MAP 1.	GREENWAY SEGMENTS	4
MAP 2.	REGIONALLY SIGNIFICANT FACILITIES	6
MAP 3.	SOILS (2)	8
MAP 4.	CREEKS, LAKES, WETLANDS	11
MAP 5.	100-YEAR FLOOD PLAIN (2)	13
MAP 6.	ECOLOGICAL COMMUNITY TYPES	15
MAP 7.	ECOLOGICAL SURVEY SITES	23
MAP 8.	ARCHAEOLOGICAL SENSITIVITY	25
MAP 9.	POTENTIAL AND KNOWN POLLUTION SITES	30
MAP 10.	PUBLIC PARCEL ACQUISTIONS	36
MAP 11.	PRIORITY PARCEL ACQUISTIONS	37
MAP 12.	PROPOSED STORMWATER MANAGEMENT PROJECTS	87
MAP 13.	PREFERRED DESIGN CONCEPT	111

LIST OF FIGURES

		Page No.
FIGURE 1.	TYPICAL SIGNAGE DEVELOPMENT	40
FIGURE 2.	TYPICAL SOIL CEMENT PEDESTRIAN TRAIL	42
FIGURE 3.	TYPICAL PEDESTRIAN BOARDWALK	43
FIGURE 4.	TYPICAL PEDESTRIAN BRIDGE	44
FIGURE 5.	TYPICAL MULTI-USE TRAIL	45
FIGURE 6.	TYPICAL MULTI-USE BOARDWALK	46
FIGURE 7.	N.W. 8TH AVENUE TWO-WAY MULTI-USE TRAIL	48
FIGURE 8.	PREFERRED SITE PLAN FOR LOBLOLLY AREA	50
FIGURE 9.	BLACK ACRES NEIGHBORHOOD MULTI-USE TRAILS	52
FIGURE 10.	TYPICAL BRIDGE DETAILS	53
FIGURE 11.	TYPICAL BRIDGE UNDERPASS FOR MULTI-USE TRAIL	55
FIGURE 12.	MULTI-USE TRAIL BETWEEN CREEKSIDE MALL AND APARTMENTS	56
FIGURE 13.	UTILIZATION OF SUGARFOOT PRAIRIE STORMWATER MGMT BERM	58
FIGURE 14.	TRAILS AT THE S.W. 20TH AVE. BRIDGE	60
FIGURE 15.	INTERSTATE-75 OVERPASS AT HOGTOWN CREEK	62
FIGURE 16.	TYPICAL BOARDWALK FACILITY AT LAKE KANAPAHA	63
FIGURE 17.	TRAIL HEAD FACILITIES AT KANAPAHA BOTANICAL GARDENS	65
FIGURE 18.	OBSERVATION PLATFORM AT LAKE KANAPHA	67
FIGURE 19.	TYPICAL PARALLEL EQUESTRIAN AND PEDESTRIAN TRAILS	68
FIGURE 20.	TYPICAL GREENWAY FENCING	79
FIGURE 21.	DESIGN STORM RAINFALL DATA	85

INTRODUCTION

Master Development & Management Plan
Hogtown Creek Greenway
Gainesville, Florida

INTRODUCTION

In 1967, the Gainesville Department of Community Development first identified the Hogtown Creek flood plain as a potential open space system worthy of protection from urban encroachment and for the future enjoyment of residents. A 1970 study by Smith and Sanderson proposed that the Hogtown Creek flood plain should become a linear open space system that provides stormwater runoff control, protects water quality, and serves as a vegetative buffer between land uses. The study envisioned a network of trails for hiking, biking and canoeing that linked neighborhoods to parks and places for shopping and employment. The study also recommended that the flood plain be preserved as a refuge for wildlife.

Over the years numerous studies have been completed for the Hogtown Creek flood plain, all of which reached the same conclusion as the Smith and Sanderson study. For example:

- In 1973, the North Central Florida Regional Planning Council identified Hogtown Creek as over-developed and recommended a multi-use recreational land use concept that would protect the natural resources of the creek and flood plain lands.
- In 1974, a study by Christensen called for the establishment of a greenbelt system for the Hogtown Creek drainage basin.
- In 1978, a study of the Hogtown Creek flood plain by the University of Florida, Department of Landscape Architecture (Cooper) cites the lack of recreational facilities west of 13th Street, and recommends a "greenspace" system of trails that would link parks and schools to neighborhoods.

In 1982, the City of Gainesville adopted a creek protection ordinance prohibiting development within 35 feet of the centerline of Hogtown Creek, and restricting or prohibiting some forms of urban development 35 to 150 feet of the creek. This action began a process of further protection by the City, including the acquisition of property and adoption of the Comprehensive Plan (1991) which called for the establishment of greenways throughout the city and surrounding areas. Since 1984, the City has acquired 191 acres of land adjacent to the creek in an effort to comply with the recommendations of these planning studies.

In 1992, the City applied for a Florida Communities Trust (FCT) Preservation 2000 Program grant, to fund the acquisition of lands for the proposed Hogtown Creek Greenway, a 6-mile, 1,786 acre multi-objective study corridor. FCT grants are provided to improve the quality of life in Florida communities through recreation and conservation oriented projects. Out of 50 project applications state-wide, the Hogtown Creek Greenway was ranked # 1 by FCT and received its top financial award.

In March 1993, the Consulting Team of Buffington Associates of Gainesville, FL and Greenways Incorporated of Cary, NC were employed by the City of Gainesville to prepare a Master Development and Management Plan for the Hogtown Creek Greenway to satisfy guidelines set forth by the FCT grant, and provide direction to the City for future project implementation. This Master Development and Management Plan report is intended to provide resolution to the acquisition of lands for the greenway, development recommendations for greenway facilities, and operation, management and maintenance guidelines to ensure that the project protects the public health, safety and welfare of community residents. This document serves as a complement to the graphic plan maps, design sketches and other planning materials prepared by the Consulting Team.

Citizen participation in the planning and design of the Hogtown Creek Greenway has been and continues to be of prime importance to the City of Gainesville. Through an extensive national review of similar greenway projects, the City has learned that many successful greenways are designed, implemented and managed through public-private partnerships with local residents. This project has been organized and administered to include the participation of local citizens. On April 23, 24 and 25, 1993, a citizens-oriented Hogtown Creek Greenway Design Charette was conducted by the Consulting Team and City and Alachua County staffs to solicit concerns, ideas and recommendations from the community regarding future design development of the project. The conclusions from this charette form the basis for recommendations within this report. These recommendations are supplemented with the expertise of the Consulting Team, and professional staffs from the City and County, to satisfy the planning and design requirements of the project.

Most importantly, this Development and Management Plan addresses and satisfies requirements of the Florida Communities Trust Program 2000 grant, defining:

- the purpose of the greenway and activities that will be promoted through project implementation.
- physical improvements that will be made to greenway lands, including access and alterations to land use or landscape character, size/type of facilities, easement, concessions and leases that will be granted, and permits that are required for development.
- key management issues related to maintenance, security, staffing, natural resource protection, archaeological and historical protection, and how management will be coordinated with adjacent land uses.

- resource enhancement, including restoration of plant and animal habitat, wetlands and surface water quality.
- cost estimates and funding sources for land acquisition, facility design development, maintenance, restoration and enhancement activities.
- priority schedule for funding and implementation of project activities.
- a monitoring plan for development and management of project lands and activities.

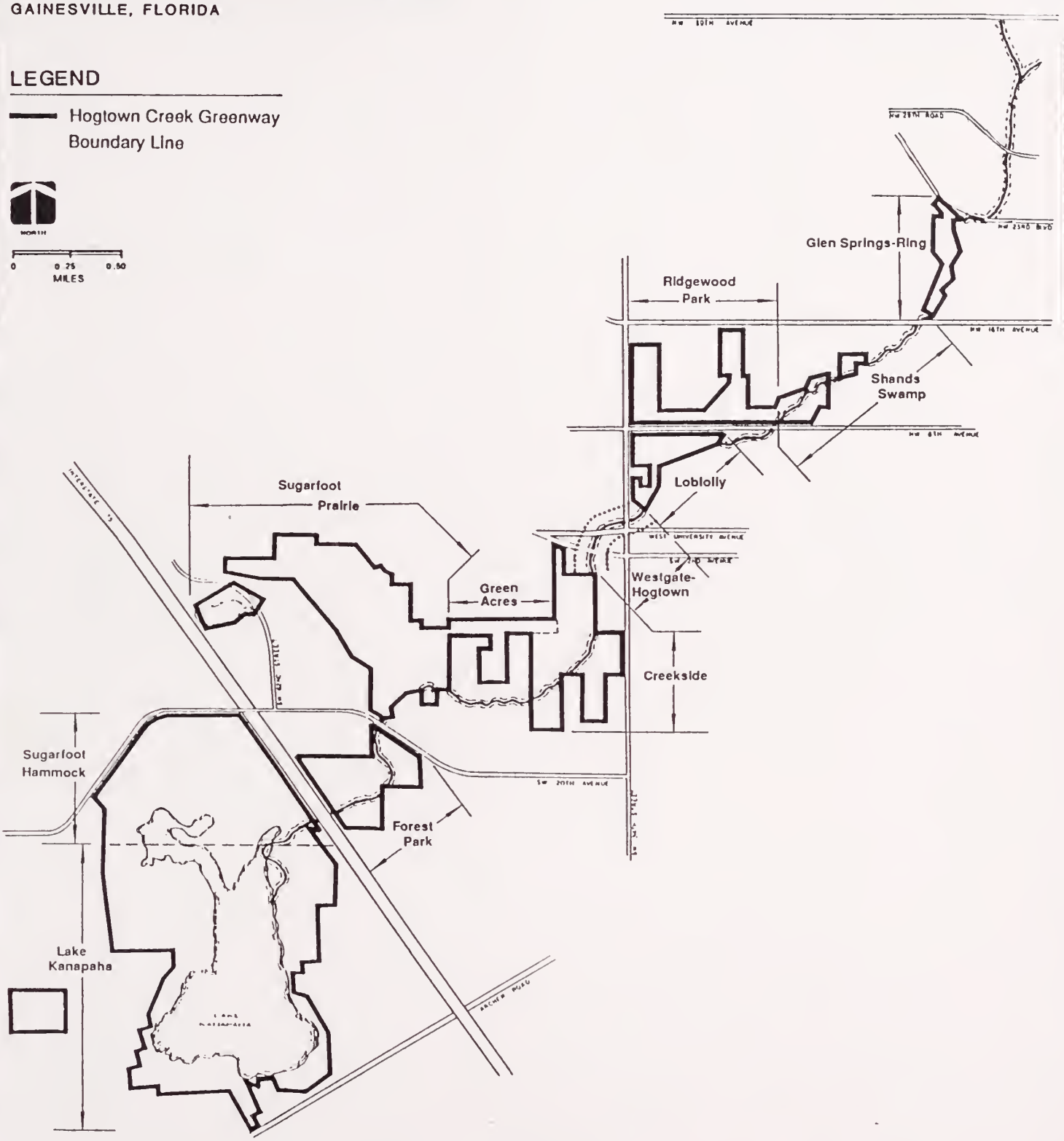
During the development of the Master Development and Management Plan it was discovered that sixteen parcels, FCT-1 through FCT-16, all of which are located between NW 39th Avenue and NW 23rd Boulevard, were inadvertently not designated on the Recreational Greenways map in the data and analysis report of the City's newly adopted Comprehensive Plan. As a result, these parcels could not legally be included as part of the Hogtown Creek Greenway Project site or its Master Development and Management Plan. The loss of these parcels reduced the Project Site to a 6-mile, 1,786-acre study corridor (See Map 1). Consequently, the City of Gainesville's City Commission has gone on record stating that in 1994, the Land Development Code will include these sixteen parcels as designated greenway lands within the City's Greenway District, as originally intended.

The Comprehensive Plan gives the City the authority to modify the Recreational Greenways Map through Policy 2.1.3 of the Recreation Element, which states that: by 1994, the City shall develop public access trails or boardwalks along publicly-owned segments of Hogtown Creek. The City Commission will adopt by resolution an amendment to the Recreational Greenways Map to include the sixteen parcels. This amendment action and changes to the Land Development code will be reflected in the Hogtown Creek Greenway Project 1994 Annual Report to be presented to the Florida Communities Trust.

Greenway Segments

Hogtown Creek Greenway

GAINESVILLE, FLORIDA



MAP 1

Prepared by the
Department of Community Development
August 1992

PROJECT PURPOSE

PROJECT PURPOSE

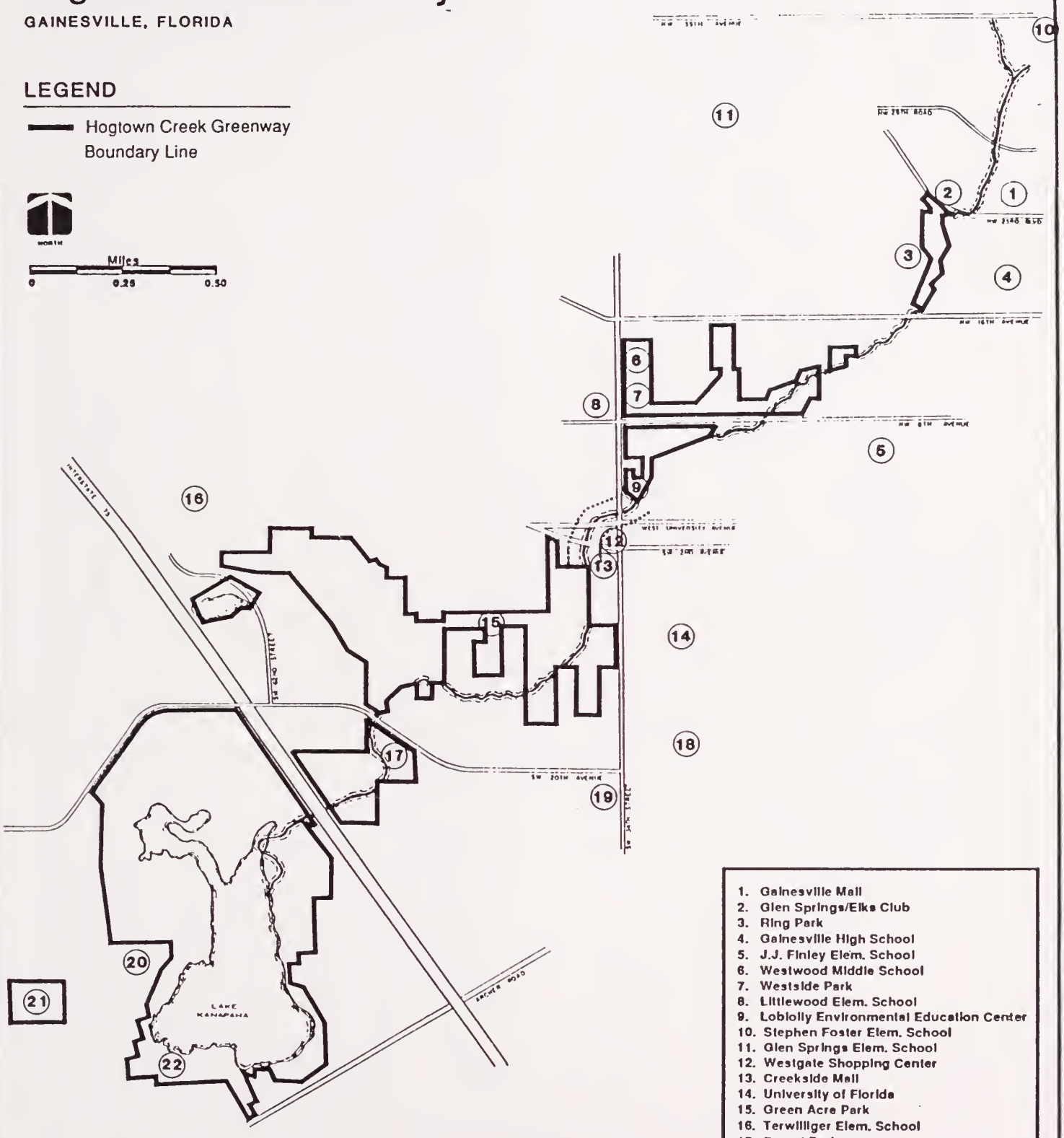
It is the primary objective of the proposed Hogtown Creek Greenway is to protect, restore and preserve the remaining ecologically sensitive and important landscape features within the Project Site, and secondarily, to provide structured and controlled access to these lands through a comprehensive network of trails and other public facilities.

The proposed Hogtown Creek Greenway is a 1,786 acre, 6-mile multi-objective study corridor that extends from NW 23rd Boulevard to Lake Kanapaha in the City of Gainesville and portions of Alachua County, Florida. This unique community project offers local residents with an opportunity to protect important open space lands for biological diversity, improve water quality, mitigate stormwater flows and enhance aesthetic beauty of the landscape. The greenway will provide residents with access and use of some protected lands through a system of designated off-road, multi-purpose trails for environmental education, resource-based passive recreation and alternative transportation, serving to link community resources together (See Map 2). Finally, this project will make highest and best use of certain lands that serve important ecological functions, and revitalize, through redevelopment, some existing land uses so that they are better able to function as community resources.

Regionally Significant Facilities

Hogtown Creek Greenway

GAINESVILLE, FLORIDA



MAP 2

Prepared by the
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August 1992

EXISTING CONDITIONS

EXISTING CONDITIONS

ENVIRONMENTAL AND ECOLOGICAL RESOURCES

The City of Gainesville, Alachua Conservation Trust and Consulting Team members Wild Things, Inc. and A. F. Clewell conducted an extensive evaluation of the Hogtown Creek flood plain and landscapes within the Project Site. The results of these evaluations are summarized in the following text. A more in-depth evaluation of ecological communities authored by Wild Things and A. F. Clewell is provided in Appendix A of this report. The Project Site is comprised primarily of bottomland forests, flood plain landscapes and upland mixed forests, most of which are densely vegetated, and provide excellent habitat for a variety of plants and animals. The Project Site is one of the most biologically unique environments in North Central Florida, supporting a broad diversity of ecological communities.

TOPOGRAPHY

The Hogtown Creek drainage basin is characterized by gentle to flat slopes through much of the middle portion of the Project Site. In the northern sections, steep slopes border the creek, and around Lake Kanapaha, elevated limestone bluffs border the southeastern edge of the lake.

Much of the natural topography along the Project Site has been altered by man through the years. Significant changes include roadway beds, cut and fill slopes that support urban development, berms to guide the flow of stormwater, and channelized sections of the creek.

GEOLOGY, SOILS AND GROUND WATER

Alachua County is underlain by marine and non-marine deposits of sand, clay, marl, gravel, limestone, dolomite and dolomitic limestone. The Hawthorn Group clays are located northeast of the Interstate 75 corridor, within areas known as the Northern Highlands Marginal Zone. Creeks and streams in this zone flow into sinkholes either before or after they enter the Western Valley limestone plain, and continue to cut headward into the Highlands Plateau to the northeast. Karst features are particularly well developed along the linear cross-country fracture zone which runs in a northwest to southeast direction through the zone. Both the Hawthorn and underlying limestone are extensively fractured in the zone. The Western Valley lies southwest of the I-75 corridor, and includes the Lake Kanapaha area. In the Valley, the clay layer is absent, and the Ocala Group limestones are at the surface, contributing to the unique bluffs that surround the southeastern edge of the Lake. See soil types represented in the Project Site shown on Map 3. (Source: Gainesville Department of Community Development 1991)

The Project Site is underlain by three aquifer systems: the surficial aquifer (water table), the intermediate aquifer, and the Floridan aquifer. Southwest of I-75, only the Floridan is present. The surficial ground water zone consists of a sequence of undifferentiated, relatively porous sands and clayey sands which are typically 10 to 30 feet thick in the Gainesville urban area. Where present,

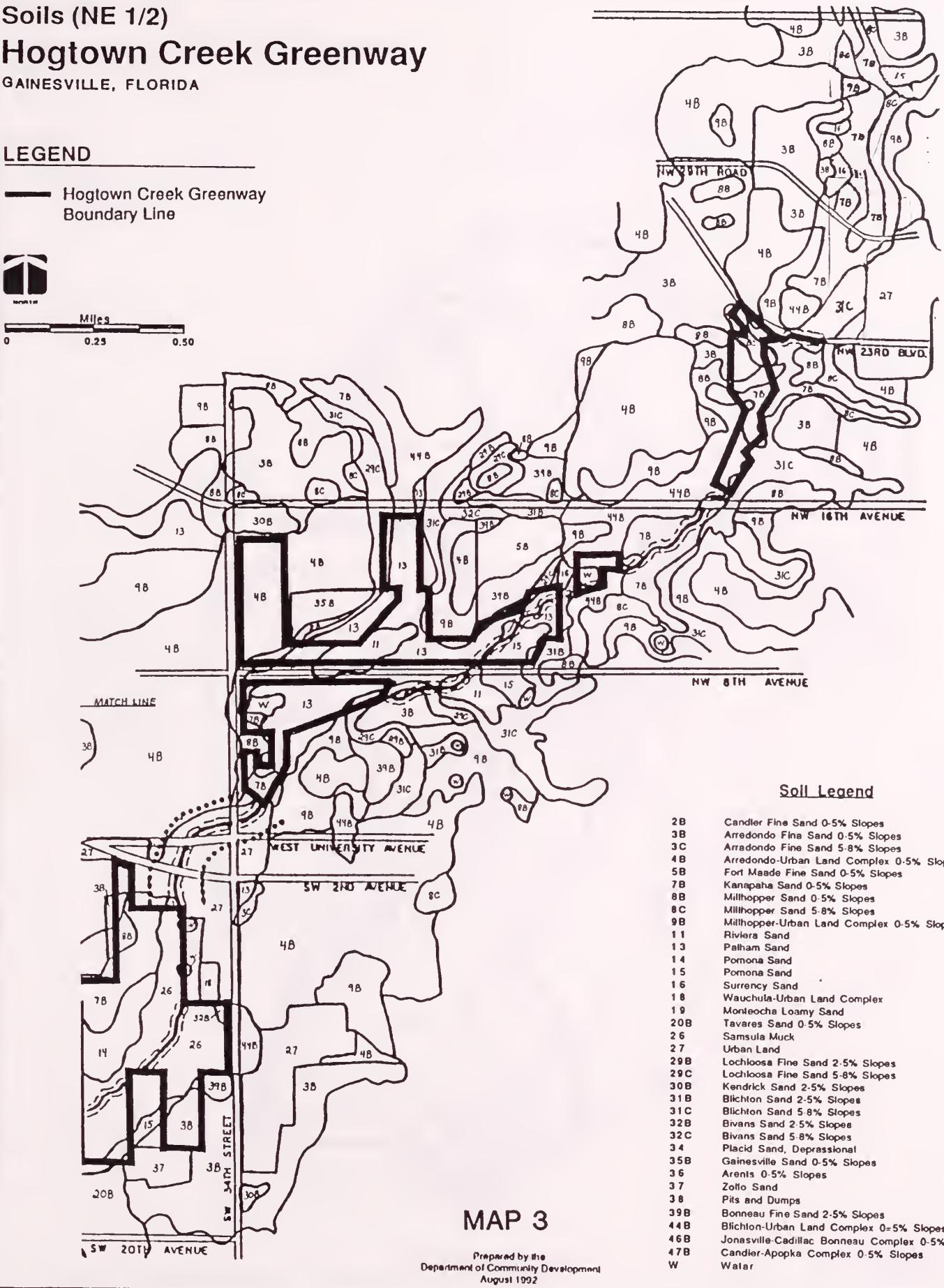
Soils (NE 1/2)

Hogtown Creek Greenway

GAINESVILLE, FLORIDA

LEGEND

Hogtown Creek Greenway Boundary Line



Soil Legend

2B	Candler Fine Sand 0-5% Slopes
3B	Arredondo Fine Sand 0-5% Slopes
3C	Arredondo Fine Sand 5-8% Slopes
4B	Arredondo-Urban Land Complex 0-5% Slopes
5B	Fort Meade Fine Sand 0-5% Slopes
7B	Kanapaha Sand 0-5% Slopes
8B	Millhopper Sand 0-5% Slopes
8C	Millhopper Sand 5-8% Slopes
9B	Millhopper-Urban Land Complex 0-5% Slopes
11	Riviera Sand
13	Pelham Sand
14	Pomona Sand
15	Pomona Sand
16	Surrency Sand
18	Wauchula-Urban Land Complex
19	Monteocha Loamy Sand
20B	Tavares Sand 0-5% Slopes
26	Samsula Muck
27	Urban Land
29B	Lochloosa Fine Sand 2-5% Slopes
29C	Lochloosa Fine Sand 5-8% Slopes
30B	Kendrick Sand 2-5% Slopes
31B	Blichton Sand 2-5% Slopes
31C	Blichton Sand 5-8% Slopes
32B	Bivans Sand 2-5% Slopes
32C	Bivans Sand 5-8% Slopes
34	Placid Sand, Depressional
35B	Gainesville Sand 0-5% Slopes
36	Arents 0-5% Slopes
37	Zolfo Sand
38	Pits and Dumps
39B	Bonneau Fine Sand 2-5% Slopes
44B	Blichton-Urban Land Complex 0-5% Slopes
46B	Jonasville-Cadillac Bonneau Complex 0-5% Slopes
47B	Candler-Apopka Complex 0-5% Slopes
W	Water

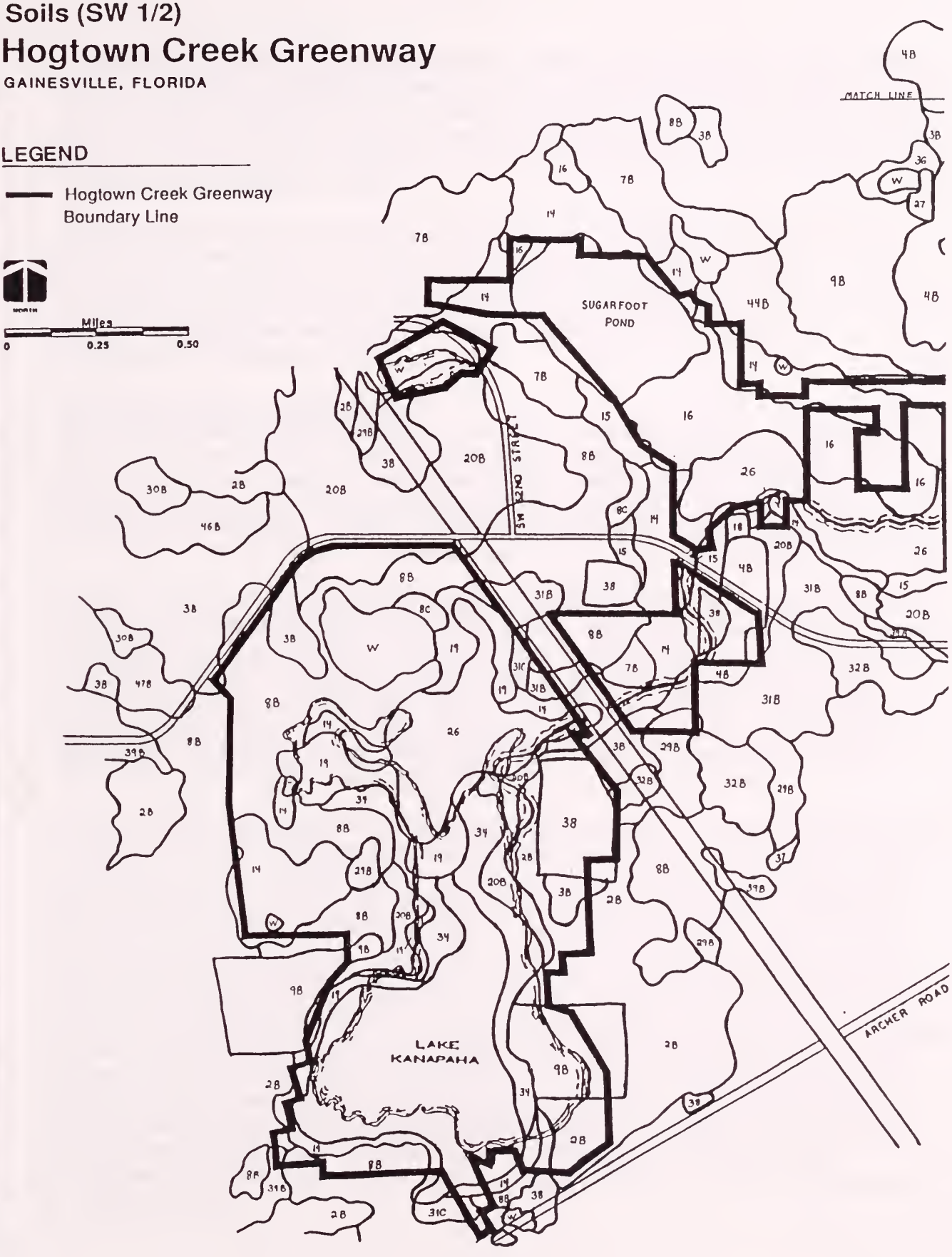
MAP 3

Prepared by the
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August 1992

Soils (SW 1/2)

Hogtown Creek Greenway

GAINESVILLE, FLORIDA



MAP 3 cont.

Prepared by the
Department of Community Development
August 1992

the surficial aquifer in this zone operates under mainly confined, water table conditions. The Hawthorn Formation is the intermediate zone, and the aquifer in this zone is contained under confined conditions. In the urban area, water withdrawn from both the surficial and intermediate aquifers is used for domestic and landscape irrigation purposes.(Source: Gainesville Department of Community Development 1991)

In the Project Site, the Hawthorn Formation is variable in thickness and perforated by sinkholes, leaving the Floridan semi-confined. Ground water flow within the Floridan is to the west/northwest. However, in the northeastern portions of the Project Site, flow movement is to the northeast due to the municipal well field. (Source: Gainesville Department of Community Development 1991)

SURFACE WATER HYDROLOGY

The Project Site is wholly contained by the Hogtown Creek watershed basin, which is approximately 13,700 acres in size. Annual rainfall averages 52 inches, with about half occurring during the months of June through September. Major surface waters within the Project Site include Hogtown Creek, Lake Kanapaha, Hogtown Prairie, Haile Sink and Sugarfoot Hammock and Prairie (refer to Map 4). Surface water flow is from northeast to southwest.

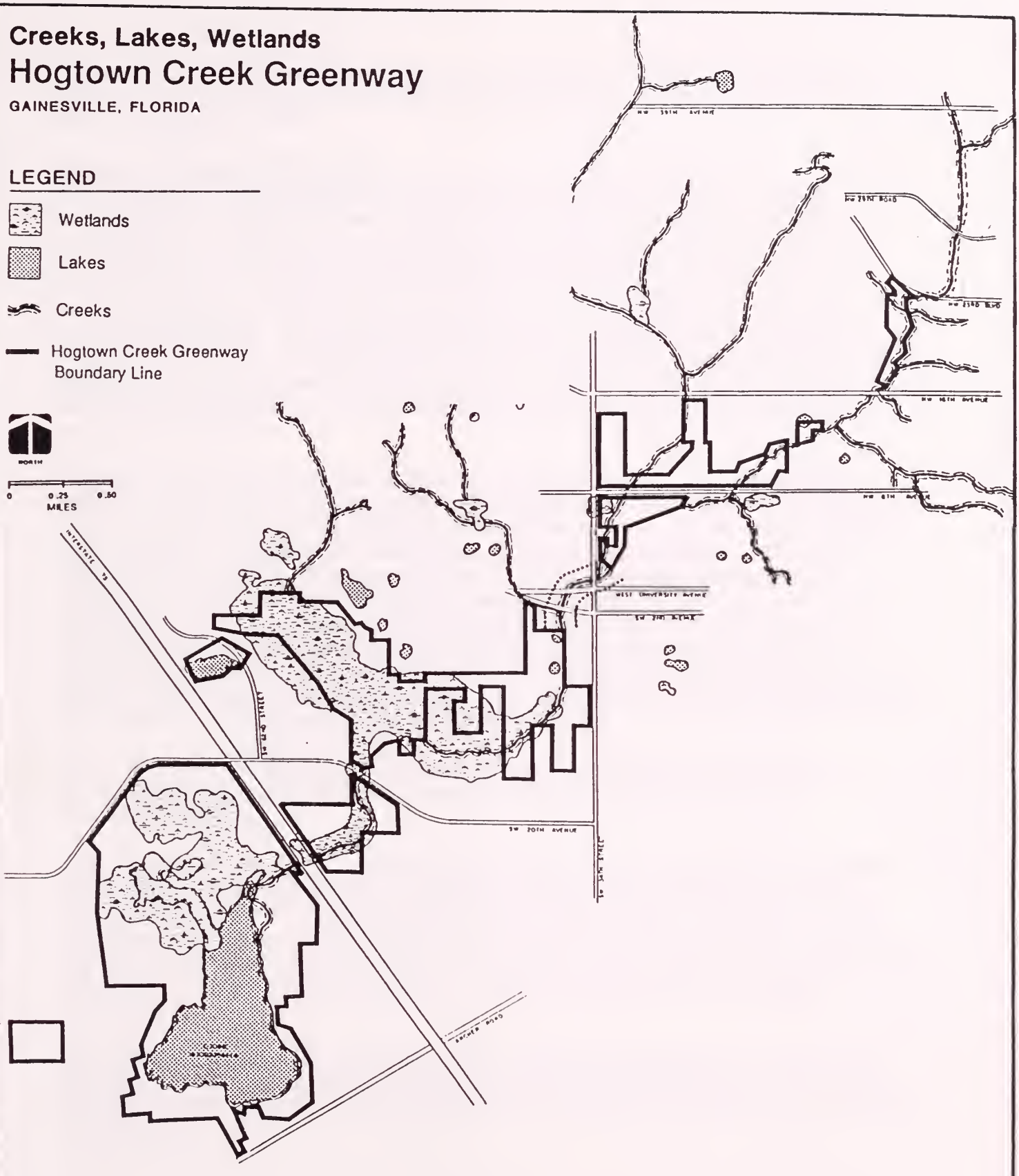
Hogtown Creek is a stream-to-sink system, originating at several spring heads and eventually draining into Haile Sink, which discharges into the lower part of the Ocala Group limestone. This 180-foot sinkhole has recorded flows that vary from a low of 1.2 cubic feet per second to a high of 671 cubic feet per second. Recharge is to the upper zone of the Floridan aquifer, and together with Alachua Sink and Lake Alice, accounts for 75 percent of the recharge in the greater Gainesville urban area. (Source: Alachua Conservation Trust 1992, Gainesville Department of Community Development 1991)

Hogtown Creek itself represents elements of three unique riverine communities: Spring-run Stream, Seepage Stream and Blackwater Stream. While the creek originates north of Gainesville in the Buck Bay and Potato Patch areas, the upstream portion of the creek receives year-round flow from Glen Springs at 23rd Avenue and Seepage along the creek banks from south of 39th Avenue. For the most part the creek waters are typically clear coming from the springs and seepage, in periods of high flow the water is perceptibly blackened due to the high level of tannins present from decomposing needles and leaves. Mid-valley areas of Hogtown Creek are subject to sheet-flow during periods of storm runoff. After reaching base level, streams shift their positions in their wide valleys with each flood water event. Former channels are abandoned and the character of the creek takes on a braided appearance. Following flooding, former channels remain filled with standing water, a condition that not only contributes to occasional increases in the "blackwater" color, but also promotes the breeding of amphibians and insects. (Source: Wild Things and A. F. Clewell 1993)

Creeks, Lakes, Wetlands

Hogtown Creek Greenway

GAINESVILLE, FLORIDA



MAP 4

Prepared by the
Department of Community Development
August 1992

Please refer to Map 5 which illustrates the general location of flood plains within the Project Site. Most of the proposed greenway lies within the flood plain of Hogtown Creek.

FLORA WITHIN STUDY AREA

The Hogtown Creek drainage basin represents a variety of mesic upland, wet flatwoods, flood plain and basin wetlands, lacustrine, riverine, and xeric communities. Recognized community types closely parallel those defined by the Florida Natural Areas Inventory (FNAI) classification system. Many of these habitats are remarkably well represented and despite a long history of human impacts in and around the area, have maintained a high level of ecological integrity. The habitats encountered, though sometimes distinct, are frequently observed as ecological gradations amongst the more purely described "types." This point is particularly important to the project, where a long history of human occupation of, and interaction with the areas natural resources is evident (See Map 6).

Descriptions of general types of habitats are important to the processes of design and broad scale management. The plant list (Please see Appendix A) consists of 531 taxa, of which 473 are identified to species and 58 are known only to genus. Seventeen of the species encountered are state or federally listed or proposed for listing as species of special concern, threatened or endangered. Many more of the species are considered by local experts rare or uncommon. Several species were encountered that had not previously been documented from Alachua County and thus, a range extension was established. At least 17 species of exotic plants were identified, although it is believed that many more exotics exist. The plant list provided in Appendix A of this report is the most complete for Hogtown Creek.

The evaluation of flora throughout the Project Site defines the presence of thirteen distinct vegetative communities. A brief description of each community follows:

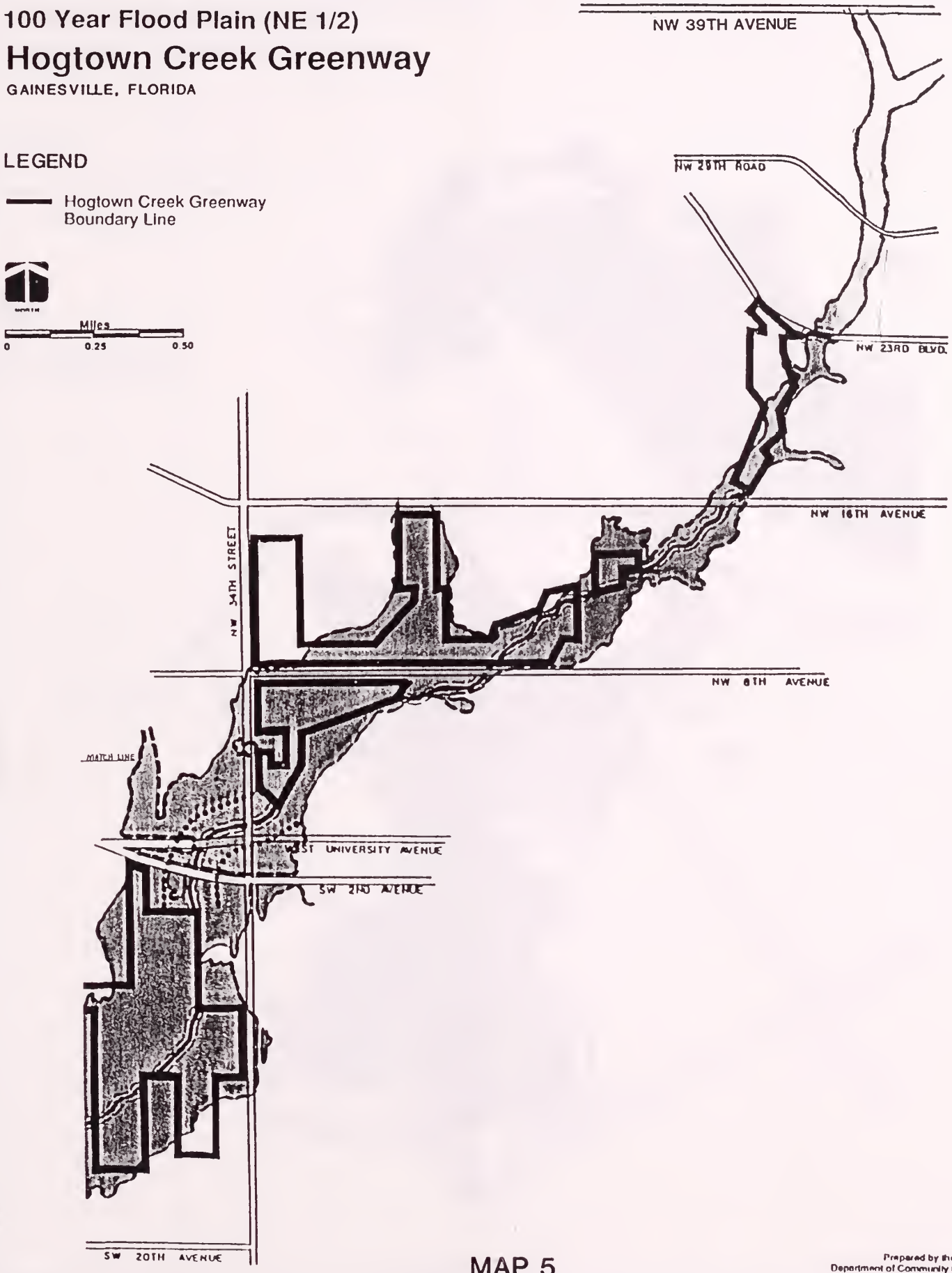
Upland Mixed Forest - Found primarily in the northern and southern portions of the Project Site, this dominant habitat is found from NW 23rd Avenue to NW 16th Avenue and within uncleared lands around Lake Kanapaha. These landscapes are characterized by closed-canopy forests of upland hardwoods. Sugarfoot Hammock is an example of this type of forest within the Project Site and is home to the extremely rare and unique Sugarfoot Fly (*Neopalpus nearcticus*).

Upland Mixed Forest habitats have been reduced dramatically by residential and silvicultural development. Most of these forests seem to be increasingly invaded by exotic plants, a cause for serious concern if ecological integrity is to be protected.

100 Year Flood Plain (NE 1/2)

Hogtown Creek Greenway

GAINESVILLE, FLORIDA



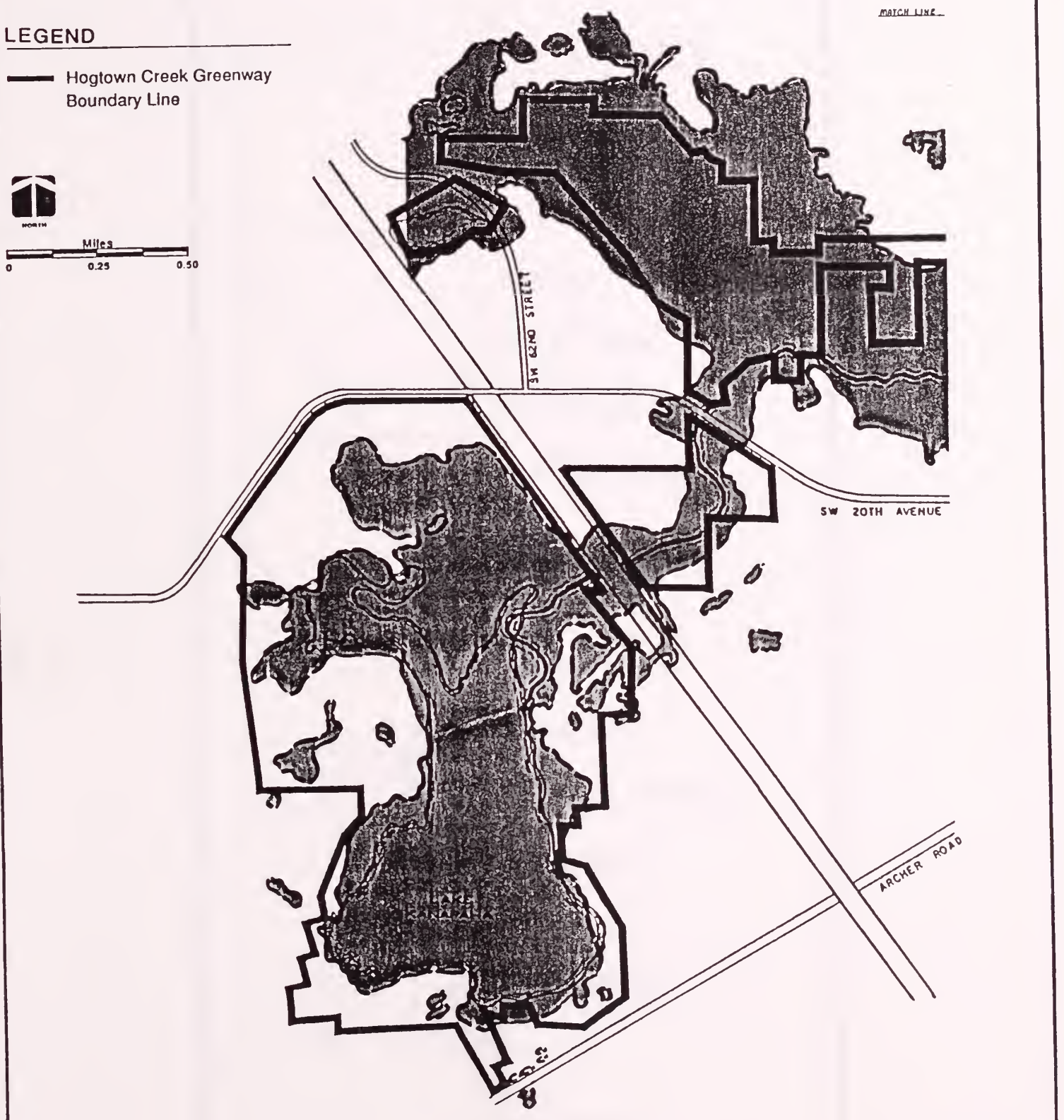
MAP 5

Prepared by the
Department of Community Development
August 1992

100 Year Flood Plain (SW 1/2)

Hogtown Creek Greenway

GAINESVILLE, FLORIDA

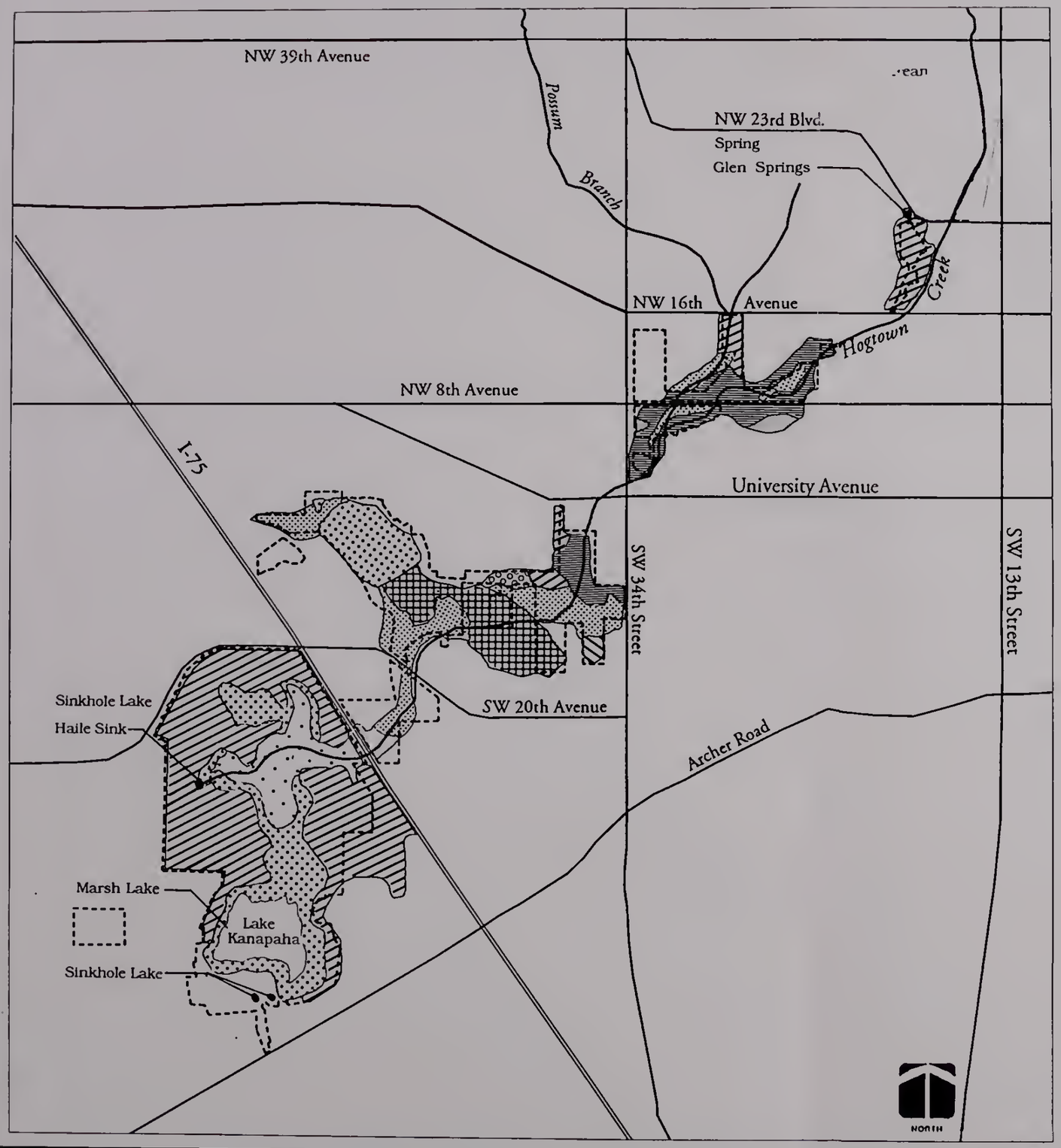


MAP 5 cont.

Prepared by the
Department of Community Development
August 1992

HOGTOWN CREEK GREENWAY

Gainesville, Florida



Community Types

- Bottomland Forest
- Basin Marsh
- Basin Swamp
- Floodplain Forest
- Floodplain Marsh
- Floodplain Swamp
- SEE LEADER Marsh Lake
- SEE LEADER Spring
- SEE LEADER Sinkhole Lake
- SEE LEADER Seepage Stream
- Upland Mixed Forest
- Xeric Hammock
- Sand Hill
- Developed Areas

miles

0 1 2

Bottomland Forest - Occurs south of 16th Avenue in large patches frequently grading into areas of Flood plain Forest and other, wetter habitats. These forests are characterized by low-lying, closed-canopy, tall, straight trees with either dense shrubby understory and little ground cover, or an open understory and ground cover of ferns, herbs and grasses. While typical bottomlands are subject to annual or semi-annual flood events, the Hogtown Creek bottomlands are more frequently flooded. In addition, the volume of drainage through these bottomlands has been increasing steadily due to urbanization of the watershed. Consequently, it is likely that species diversity has been reduced and levels of exotics increased.

Flood plain Forest - These forests overlap throughout the Hogtown Creek flood plain with Bottomland Forests. In the southern portion of the creek system, they grade into Flood plain Swamp. The hydroperiod of this forest type is the principal defining character. The forests are flooded for up to half the growing season. While these forests are usually without standing water during the dry season, the seasonal flooding experienced in the summer is critical to the health of the forests themselves as well as the communities downstream. Species composition of this community could be severely impacted by changes in the levels and course of the creek.

Flood plain Marsh - At least two pockets of Flood plain Marsh were identified. Both are associated with the Flood plain Forest south of NW 8th Avenue and one of the sites is just outside the study area. The habitat is characterized by herbaceous vegetation (typically grasses and sedges) with some small shrubs. According to FNAI, these areas experience regular and frequent flooding (250 days/year), as well as occasional low intensity burns (every 1-5 years). These conditions keep invasive shrubs and trees from expanding into the marsh and, eventually, excluding the grasses. This area, however, may now be encroached upon so heavily by residential development that future safe burning is not possible. Succession to Flood plain Forest is probable.

Flood plain Swamp - An extensive area of Flood plain Swamp extends from the southern edge of the Sugarfoot Prairie to just west of SW 34th Street. The abundance of buttressed trees and high lichen lines in this habitat attest to the high frequency of flooded conditions. Many small areas within this habitat hold isolated ponds of water for long periods of time, releasing them only as floodwaters return to flush them out. This release of leaf-litter steeped water is partly responsible for the blackwater aspects of the creek. These isolated ponds are also critical for the reproductive cycle of many amphibians.

Basin Marsh - Also called Wet Prairie, this habitat dominates Sugarfoot Prairie and extends south around Lake Kanapaha. The area probably developed in a solution depression and is fire- and hydroperiod-maintained. Flooding at least 200 days per year and burning every 1-10 years has kept this area from more serious encroachment by arboreal species.

Basin Swamp - Beginning just east of I-75 and continuing west at the lower portion of the Project Site, Bottomland Forests grade into Basin Swamp, and Hogtown Creek becomes highly divided, even in times of very dry weather. To the north is the upland mixed forest habitat of Sugarfoot Hammock and to the south is Lake Kanapaha. It is characterized by periodic dry periods and occasional fire. Hydroperiods are critical, as in other wetland communities, in maintaining species diversity and preventing catastrophic fires.

Marsh Lake - Lake Kanapaha is a large shallow depression lake surrounded by bands of aquatic vegetation but it is open in the middle. Lake water is derived mostly of runoff from surrounding uplands, and the lake functions as an aquifer recharge source in times of drought (FNAI). However, the lake's water level can fluctuate in response to ground water levels and water volume in the Creek. Even though water levels change significantly in the lake, it is permanent home to many species.

Sinkhole Lake - These deep inverted cone-shaped depressions occur on limestone formations, where subsurface solution erosion reduces the layer above, resulting in collapse of the surface. As a result, these depressions fill with runoff water or ground water. This habitat is considered endangered in Florida, and should be protected from erosion-causing uses, including high intensity unpaved trails. There are two sinkhole lakes at the south end of Lake Kanapaha.

Xeric Hammock - An isolated area of this unique habitat occurs in Green Acres Park, where it abuts Flood plain Swamp with almost no ecotone transition. It is common to find young xeric hammock, but very rarely do you find mature xeric hammock. This habitat is an artifact of more extensive Sandhill areas of the ancient past, and is becoming increasingly rare because of its suitability for urban development.

Sandhill - Characterized by open sand on rolling hills with longleaf pine, wiregrass, and gopher tortoises, this type of community was once common within the Gainesville City limits, but is rarely found today. Fire is a dominant ecological factor in this community type. Frequent fire (every 2-5 years) helps to maintain this habitat and the plants within. Gopher tortoises are abundant in this area. This area is also extremely fragile and should be protected from high-intensity passive recreation activities.

THREATENED SPECIES

The following is a listing of rare, uncommon, threatened or endangered species that are known to exist within the Project Site:

Coontie	*Zamia floridana*
Needle Palm	*Rhapidophyllum histrix*
Jackson Vine	*Smilax smallii*
Godfrey's Privet	*Forestiera godfreyi*

INVASIVE OR NON-NATIVE VEGETATION

The most significant invasive, non-native vegetation found within the Project Site includes:

TREES

Mimosa	*Albizzia julibrissin*
Japanese Paper Mulberry	*Broussonetia papyrifera*
Camphor Tree	*Cinnamomum camphora*
Chinaberry	*Melia azedarach*
Chinese Tallow	*Sapium sebiferum*
Green Ligustrum	*Ligustrum lucidum*
Variegated Ligustrum	*Ligustrum sinense*

VINES

Coral Vine	*Antigonon leptopus*
Air Potato	*Dioscorea bulbifera*
Japanese Honeysuckle	*Lonicera japonica*

HERBACEOUS ANNUALS & PERENNIALS

Mexican Clover	*Richardia scabra*
Wandering Jew	*Tradescantia fluminensis*

(Source: Alachua Conservation Trust)

FAUNA WITHIN STUDY AREA

The landscapes evaluated as part of the Project Site contain an abundant variety of wildlife. Due to the fact that the Project Site is narrow in parts, and linear by purpose, a comprehensive evaluation of all species is not possible, as many animals may only be passing through the corridor on their way to other destinations. The Consulting Team has generated a list of fauna from fieldwork, personal communications with authorities in this area of study, and literature review. Lists of most common types of wildlife are provided in Appendix A of this report.

The evaluation of fauna throughout the Project Site defines four distinct groups. A brief description of each group follows:

Mammals - Numerous small rodents and insectivores are common in each of the habitats previously described. Other large mammals, such as armadillos and opossums are common, while spotted skunks, striped skunks, and gray foxes are infrequently observed. Three species of rabbit are known to exist, and are common to the grassy areas of the corridor. Coyotes are increasingly found in rural areas surrounding the City, so the possibility exists that they are passing through the Project Site corridor. River otters have been observed in Hogtown Creek within the past decade. Although they have not been visually observed, abundant otter signs have been observed as recent as June 1993.

Raccoons are very common throughout the corridor, but may be rarely seen because they are nocturnal and tend to avoid interaction with humans. Larger mammals such as deer, bear and panther will not tend to use many portions of the corridor due to human habitation. However, the Lake Kanapaha region offers opportunity for some connection to the San Felasco Hammock and Paynes Prairie. Although the benefits of the "corridor theory" (Noss and Harris 1986) to mammals is disputed, the presence of larger mammals, especially deer, may depend on how the greenway system is developed.

Birds - A diverse group of wintering migratory and breeding songbirds (passerines) and birds of prey (raptors) are supported by the variety of community types found in the study area. The Lake Kanapaha region provides excellent habitat for a variety of waterfowl, herons, and waterbirds. Over 100 species were identified by the preliminary field survey -- this should be considered a "short list" of birds for the area. Among the more significant finds are a pair of bald eagles, wood stork and the loggerhead shrike, a species which is declining throughout its range. Given the extensive conversion of forested and wetland habitats to agriculture and residential land use, this area should be regarded as critical to the continued viability of these species.

Many migratory songbirds currently breed and nest in the mixed and bottomland hardwood forests of the study area. The selection of nesting sites are probably explained in part by the absence of human occupation and active use in the area. The lack of human presence is probably also a factor in the high incidence of nesting in the larger interior woodland zones such as the Sugarfoot Prairie and Sugarfoot Hammock areas. The riparian woodlands are important for insectivorous birds, such as swallows, robins, thrushes, and warblers, while the prairie and lake areas are critical for raptors dependent on small mammals, lizards, snakes and frogs. This area is also close enough to the nesting habitats of Paynes Prairie that the open prairie species such as bittens and meadowlarks utilize the lake area.

Songbirds often increase in species diversity with suburban development. This effect is largely due to an increase in the variety of micro habitats (exotic fruit and flowering ornamentals) and frequently provided feeders. In some cases, native bird species could be reduced due to the success of other exotic species. One goal of the greenway should be to minimize this effect by preserving contiguous natural forest, where native passerines will be less threatened by crowding (Stouffer and Best 1990). Studies are ongoing as to the minimum critical size of habitat fragments for each species.

Reptiles, Amphibians and Fish - The herpetofauna of headwater areas in Hogtown Creek basin probably includes creek-side salamanders. There is also a chance that certain upland and flatwoods species intrude into these narrow valleys from adjoining habitats. There is nothing unique about midvalley amphibian and reptile faunas. The herpetofauna includes species that are adapted to variable water levels. Impoundment by road embankments on the upgrade side of midstream areas (NW 8th Avenue) impacts vegetative cover and probably disrupts terrestrial and wetland invertebrates, and, to a lesser extent, vertebrates.

Herpetological communities in the Kanapaha basin include species that favor aquatic sites. Herpetological species from this area include the rusty mud salamander. Described by Goin and Netting (1942 Ann. Carnegie Mus., 29:175-196), this salamander was initially collected in the Hogtown Creek basin. Two of the species, defined from the Consulting Team's investigations, are proposed for federal listing as Threatened species. Although not previously collected in the Project Site, these species could use ephemeral pools in the Kanapaha basin.

The gopher tortoise is a "species of special concern" in Florida, and declining in Gainesville due to habitat loss. According to the Florida Game and Fresh Water Fish Commission (FGFWFC) the respiratory bacterial disease that is reaching epidemic proportions in other areas of the state has not affected local gopher tortoise populations. Active gopher tortoise colonies exist west of the University's Behavior Research Lab and in small sandy upland patches around Sugarfoot Prairie. Over 20 burrows were located at the Behavior Lab site alone. This area is rather isolated and does not allow natural escape should conditions change. If their burrow locations cannot be protected translocation to other suitable sandhill sites is suggested.

The fish fauna includes approximately 16 native species and an undetermined number of exotics. *Notropis chalybaeus* is the only representative of a traditional creek fauna; other fish inventoried are typical of ponds, lakes and sluggish streams. Dissolved oxygen levels are critical to native fish communities, which in turn supports a variety of species including raccoons, osprey, eagles and otters. Constant flow rates in designated streams are required during the hottest periods of the year in order to ensure minimum oxygen requirements for fish. Native species have less tolerance of low oxygen levels than some exotic fish. A complete fish survey was not performed as part of the field investigations by the Team. It is suggested that the public be encouraged to work with a local agency to develop baseline information on fish populations, by recording their catches and other sampling programs.

Crustaceans, Mollusks and Insects - Large crayfish (*Pennsylvanius clarkii*), related to the Louisiana crayfish, were observed in Glen Springs, and probably occur at other locations. An unusual crayfish was reported in the late 1930's from a creek-side seepage area in the upper portion of Hogtown Creek. Other than this observation, the known range of the species is considerably north of Gainesville. The Hogtown population represents the most southern known site of occurrence. The presence of this unusual crustacean should be confirmed through more detailed investigations. Numerous species of clams and snails, as well as exotics have been recorded from Hogtown Creek, but unfortunately their status is undetermined at this time.

No comprehensive inventory of invertebrates exists for Hogtown Creek or adjacent areas. Noteworthy species include the gomphid dragonfly and the nymph, which is an extensive creek bank burrowing species and a good indicator of water quality. Some creek damselfly nymphs are also good water quality indicators. The latter species was observed extensively on the creek bottom in the NW 8th Avenue bottomlands.

Perhaps the best known insect species of the Project Site is Say's Spiketail, a large species of dragonfly that occurs in adjacent Possum Branch, and has attracted the attention of entomologists from around the world. (Bill Maufrey, Personal Communication). According to the International Odonata Research Institute, it is very likely that the Possum Branch population (the largest in the world) is not the only one in the Project Site, and that seepage dependent species may occur in the Project Site north and south of Glen Springs. The species is currently a candidate for listing by the FGFWFC and is considered vulnerable. Two additional species dependent on this seepage community are the Gray Petatail and Furtive Forktail, two rare species of damselfly that have been seen in the Glen Springs area.

Probably the best locally known of all invertebrates in the Project Site is the Sugarfoot Fly. This unique fly is the only member of its subfamily known to occur in North America (Amoroso 1991) and the Sugarfoot Hammock location is one of only two sites from which it is known. All that is known of this species is that adults are most active during the wettest part of the year -- June to October. The fly is active during the night and rests in the bark of trees during the day. The dominant tree species at the fly site are Sweetgum, Hophornbean, Sugarberry, Redbay, and Swamp Chestnut Oak. Without accurate field data, there is little that can be done to protect the species other than to leave its habitat undisturbed. The species is a candidate for listing by FGFWFC and is considered vulnerable.

Several Keynote Features of the Project Site deserve special mention, and do not conveniently fit into the description of flora and fauna. These are listed within the following Table 1 and illustrated on the enclosed Map 7, entitled Ecological Survey Sites.

CULTURAL RESOURCES

The Hogtown Creek basin was populated by native Americans for approximately 10,000 years. Several archaeological sites have been documented by the Department of State, Division of Historical Resources (DHR). The Florida Master Site File contains 15 archaeological sites within the proposed Project Site, as illustrated in Table 2. Additional sites have been cataloged in the vicinity of Lake Kanapaha and Sugarfoot Hammock. There are no known buildings of historical interest within the Project Site.

CULTURAL EVALUATION OF THE PROJECT STUDY AREA

A preliminary cultural resources evaluation of the Hogtown Creek Greenway project was conducted by SouthArc Incorporated of Gainesville, in April 1993, to identify areas of high, medium and low potential for archaeological or historical resources (See Map 8). This study defined sensitive areas within the Project Site as well as a scope of work that will be required for more intensive survey and site assessment once specific facility development projects are determined to be implemented

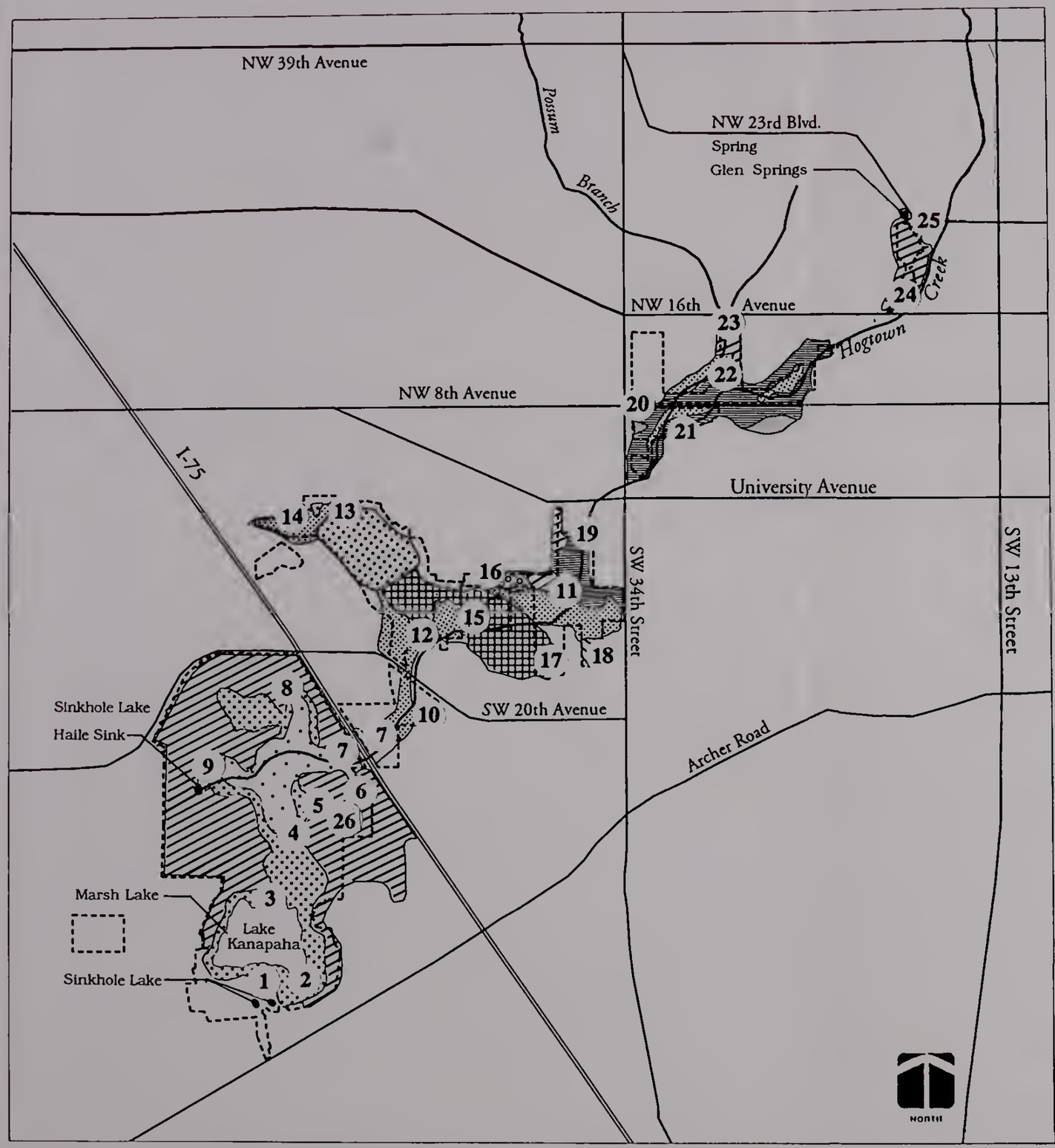
Site	Keynote Species or Features
1	Species in this wetland area include water shrew, marsh rat; osprey, ducks, coots and many migratory bird species.
2	Remarkably large sabal palms and live oaks
3	Population of aquatic plant, *Nuphar lutea;* birds include Terns, Great Blue Herons, galinule, coots. Other animals include alligators and gar fish (some over 2ft long)
4	Species include abundant nesting Osprey
5	Area contains unique limestone fault line in Mesic Hammock bordering remnant Sand Hill habitat.
6	Area is remnant Sand Hill, an ecological succession to hammock. Species include Gopher Tortoise and one of the tortoises favorite foods, the cactus *Opuntia humifusa*
7	Large individuals of Gum and Elm trees and perhaps the best seasonal population of *Lobelia cardinalis* occur where the creek becomes highly dissected.
9	Species include remarkably large examples of red bay tree, *Persea barbonia*
11	Species include *Carex intumescens, Bumelia reclinata var. reclinata, Arundinaria gigantea, Aesculus pavia, Hymenocallis rotata*
12	Area of rolling topography, dry hammock grading down to more swampy conditions near the creek
15	Most dense concentration of poison ivy observed. Occurring in the ecotone, Paw Paw (*Asimina parviflora)*
16	*Gaylussachia* sp. and other species of Xeric Hammock are well represented. The XH is considered the climax community, originally a Scrub area, fire has been excluded here for many years
17	Extensive Osprey habitat. Plant species include; *Spiranthes cernua, Epidendrum conopsium* (both orchids), *Arisaema triphyllum*, large *Quercus virginiana*
18	This "pine island" or isolated Sand Hill habitat is unique in the greenway Area, and is perhaps one of the most fragile. It is presently home to a very dense population of Gopher Tortoise which have lately been heavily predated (dug up and killed) by dogs.
19	Species incl: *Trillium recurvata, Arundinaria gigantea, Aesculus pavia, Arisaema triloba, Sabal minor*; and very large specimens of *Planera aquatica* (Water Elm)
20	Marsh is dominated by *Zizaniopsis milliacea* (wild rice)
21	Species include *Aesculus pavia, Spiranthes cernua* (orchid), *Acer floridana, Forestiera* (native privet), *Crataegus uniflora, Arundinaria gigantea, Zizaniopsis milliacea* (wild rice)
22	Species include swamp chestnut oak; *Arisaema triphyllum,* Spruce Pine (*Pinus glabra)*; clubtail dragonfly (indicator species for water quality)
24	Ring Park species include native Rhododendron, Haw, Bumelia and numerous other planted natives.
25	Species include the Needle Palm (*Rhaphidophyllum histrix)*, Hornwort (*Phaeoceros* sp.*)*, Jack-in-the-pulpit (*Arisaema triphyllum)*
26	Pair of Bald Eagles nesting just northeast of dike area. Nest is in one of only two tall pine trees available.

NOTE: NOT ALL SITES HAVE KEYNOTE SPECIES OR FEATURES

TABLE 1

HOGTOWN CREEK GREENWAY

Gainesville, Florida



Ecological Survey Sites and Community Types

- Bottomland Forest
- Basin Marsh
- Basin Swamp
- Floodplain Forest
- Floodplain Marsh
- Floodplain Swamp
- SEE LEADER — Marsh Lake
- SEE LEADER — Spring
- SEE LEADER — Sinkhole Lake
- SEE LEADER — Seepage Stream
- Upland Mixed Forest
- Xeric Hammock
- Sand Hill
- Developed Areas

miles

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NOTE:
THE SURVEY SITES INDICATED ABOVE ARE GENERAL LOCATIONS OF LARGER AREAS STUDIED.

LISTED ARCHAEOLOGICAL SITES IN THE HOGTOWN CREEK GREENWAY

Site #	Parcel	Site Name	Culture	Type
8AL02333	FCT-17	Glen Springs	Indeterminate	Artifact scatter
8AL02497	FCT-18	Colony Park	Alachua; Early Archaic	Artifact scatter
8AL00070	FCT-20	Watkins	Deptford	Artifact scatter
8AL00390	FCT-41	Un-named	Prehistoric-ceramic	Burial mounds
8AL00388	FCT-41	Un-named	Prehistoric-unspecified	Middens
8AL00463	FCT-49	Henderson Mound	Prehistoric-unspecified	Prehistoric mounds
8AL00465	FCT-51	Un-named	Archaic; Deptford	Habitation
8AL00387	FCT-52	Un-named	Prehistoric-ceramic	Midden
8AL00389	FCT-53	Un-named	Prehistoric-unspecified	Midden
8AL00258	FCT-54	Un-named	Prehistoric-ceramic	Artifact scatter
8AL00172	FCT-69	Un-named	Prehistoric-unspecified	Artifact scatter
8AL00160	FCT-62	Proctor Farm	Hickory Pond	Artifact scatter
8AL00173	FCT-62	Proctor North Field	Prehistoric-ceramic	Artifact scatter
8AL00174	FCT-62	Sam Harrell	Prehistoric-non ceramic	Lithic quarry
8AL00451	FCT-62	Proctor Farm	Prehistoric-non ceramic-archaic	Artifact scatter
8AL00159	FCT-69	B.F. Williams	Deptford	Artifact-scatter
8AL00157	FCT-71	Damron	Prehistoric-unspecified	Lithic scatter/ quarry
8AL00158	FCT-72	Arrowhead Fish Camp	Prehistoric-ceramic	Artifact scatter
8AL00443	Westgate Shopping Center	Hogtown Creek	Prehistoric-archaic	Artifact scatter

TABLE 2

HOGTOWN CREEK GREENWAY
PROJECT SITE

PREPARED FOR:
CITY OF GAINESVILLE, FLORIDA
DEPT. OF CULTURAL AND NATURE OPERATIONS

PREPARED BY:
BUFFINGTON ASSOCIATES
GREENWAYS INCORPORATED
G.L. MARQUEZ AND ASSOCIATES, INC.
ANDREW KAPLAN, ARCHITECT
A.F. CLEWELL, INC.
SOUTHARC, INC.

0 2000 Ft.

Archaeological and Historical Sensitivity Areas

- HIGH SENSITIVITY
- MEDIUM SENSITIVITY
- LOW SENSITIVITY

Terwilliger Pond
I-75
S.W. 62ND AVE.
S.W. 75TH ST. (TOWER RD.)
Sugarfoot Prairie
S.W. 24TH AVE.
Kanapaha Park
NEWBERRY RD. (S.R.26)
Loblolly Environmental Education Facility
Westwood Middle School
Opossum Creek
Westside Park
N.W. 39TH AVE.
N.W. 23RD BLVD
Lake Kanapaha
S.W. 20TH AVE.
S.W. 34TH ST.
ARCHER RD. (S.R. 24)
I-75
UNIVERSITY AVE.
S.W. 2ND AVE.
N.W. 8TH AVE.
N.W. 13TH ST (441)
N.W. 16TH AVE.
Kanapaha Botanical Gardens
Green Acres Park
Westgate Shopping Center
University of Florida
Creekside Mall
N.W. 29th Road Bridge
Gainesville Mall
Alfred A. Ring Park

MAP 8

Methodology

SouthArc employed a broad reconnaissance method for evaluating the Project Site. Project tasks included:

1) Background research to identify known sites and the environmental characteristics of the tracts proposed for greenway acquisition. This information was utilized to define the sensitive areas. The data was obtained from the record of the Florida Master Site File office, the original Federal land survey maps and notes, historic materials on file at P. K. Yonge Library of Florida History and Alachua County archives, previous cultural resource studies within the county, topographic maps, soil surveys, and historic and modern aerial photography.

2) Preparation of a brief report outlining the results of this task and the development of a map showing the levels of sensitivity within the greenway corridor. The report and this level of effort are not designed to satisfy the DHR requirements for cultural resource surveys. In order to meet those requirements, subsurface testing will be required.

Preliminary Evaluation Results

SouthArc's evaluation of archaeological and historical resources is general and has limited application as a planning and management tool. The final resource documentation will have to be prepared at a future date, based on more intensive site investigations.

High potential areas are those areas which contain known archaeological sites, or could contain such sites. Parameters for these areas include: 1) locations of known archaeological sites; 2) reasonably well drained soils and soils associated with known sites: 3) areas within 150 meters of the 66 foot contour line around Lake Kanapaha basin; and 4) level areas above the floodplain and isolated knolls within the Hogtown Creek basin.

Medium potential areas are defined as: 1) well drained high potential soils 150 meters to 200 meters above the 66 foot contour interval; 2) higher ground in proximity to isolated water sources or sinks; 3) areas of moderate slope between the 62 and 66 foot contour levels around Lake Kanapaha; and 4) areas of moderate slope within the creek basin north of the NW 22nd Street. Again, these parameters are based on the distribution of the known sites in the area.

All other areas are presently considered to have low potential for cultural resources based on the presence of wetlands, steep slopes, distance of over 200 meters from the 66 foot contour, and flatwoods areas.

There are at least 23 known archaeological sites in proximity to the Project Site. These have primarily been identified as a result of surface inspection. No formal surveys have been completed in the area of concern, so a survey would undoubtedly reveal additional sites, particularly in proximity to Lake Kanapaha and the prairie south of Oaks Mall.

Recommendations

The DHR guidelines recommend an intensive systematic subsurface survey prior to developments which utilize state funding. Subsurface testing will be required at 25 meter intervals in high potential areas, 50 meter intervals in medium potential areas, and a ten percent sample of low potential areas. An assessment of significant sites will also have to be completed. Significant sites will require mitigation of impacts through preservation or data recovery excavations. Since this project is partially funded by a state grant, DHR will request compliance with these guidelines in order to obtain permitting for the project. In addition, any cultural resources assessment surveys of the Project Site will be submitted to DHR for comment and review prior to any land clearing or ground disturbing activities.

Additionally, where properties within the proposed greenway are identified as containing a high potential for archaeological or paleontological significance, development of greenway facilities will proceed in a manner that is consistent with City and County Comprehensive Plan policies and land development regulations for protection of these resources.

Once an area of the project site has been identified as potentially having achaeological resources, a cost-effective scientific investigation to evaluate the extent and significance of the archaeological resources must be completed, before an irreversible action, such as looting, is allowed to take place.

Public disclosure of archaeological sites prior to the establishment of protective measures leads to the pilferation and destruction of the site and possibly the only information about its history. Therefore, when valuable archaeological resources are identified or suspected prior to or during an investigation, the information shall be handled with appropriate protection of its confidentiality, and provided only on a need-to-know basis to the state archaeologist, property owner, project sponsor, or public agency official responsible for project approval. In addition, the site's specific location and other pertinent information shall be omitted in public documents until protective measures are in effect.

This Master Development and Management Plan supports the provision of protective measures for cultural resources by requiring that the collection of artifacts or the disturbance of archaeological and historic sites on the Project Site is prohibited unless prior authorization has been obtained from the Department of State, Division of Historical Resources.

In addition to, and notwithstanding, the above protective measures, all applicable policies contained in the respective City and County Comprehensive Plans and all applicable land development regulations of the City and County, respectively, shall be followed, as required by law.

CULTURAL AND ENVIRONMENTAL PROGRAMS

Several cultural and environmental programs are already in existence within the Project Site. It is anticipated that these existing programs will be expanded and improved, and new programs initiated to take advantage of the unique resources within the Hogtown Creek basin. The existing programs include:

Ring Park: A 20-acre linear park located in the northern portion of the Project Site, and acquired by the City in the mid 1980's. This facility parallels the creek just downstream from Glen Springs. The City Department of Cultural and Nature Operations offers environmental education programs for adults and children, as well as passive resource-based recreation activities for park visitors.

Loblolly Environmental Education Facility: An 11-acre community facility located in the middle of the Project Site, and acquired by the City in 1990. The Facility is currently being renovated by the City and is scheduled by the City Department of Cultural and Nature Operations, and will offer environmental education programs and interactive learning exhibits for families and children.

Kanapaha Botanical Gardens: A 40-acre facility located in the southern portions of the Project Site, this facility was opened in 1978. The Gardens are operated by the non-profit North Florida Botanical Society, which offers education programs in cooperation with the Santa Fe Community College. It is the second largest botanical garden in the state, and the most varied garden in Florida.

MAN-MADE FACILITIES/LAND USE EVALUATION

Land use and zoning in and around the greenway corridor is predominantly residential, conservation and agricultural, with areas of mixed use commercial, high density residential and institutional. The Project Site corridor is bisected and bordered by several arterial and collector roadways, which provide access to local neighborhoods, shopping centers and schools.

The most significant negative impacts experienced by environmental features in the Project Site, have been and will most likely continue to be: roadways, parking lots, illegal dumping of trash, leaks from underground hazardous materials and storage tanks, leaks and spills from industrial and commercial hazardous material sites and hazardous material handling activities. Residential homes near the Project Site also result in significant impacts, including the clearing of riparian vegetation; pesticide, herbicide, and fertilizer runoff; erosion and sedimentation; uncontrolled cats and dogs; noise; introduction of exotic species of flora and fauna; septic tank releases and sewage pipe leaks. (Source: Gainesville Department of Community Development, 1991; Cooper 1978) In the past 15 years, the corridor has become more popular with both pedestrians and bicyclists. Because of this increased popularity, and the inability to control the use and access, these users have caused significant impact and degradation in various areas along the corridor.

POTENTIAL AND KNOWN POLLUTION SITES/DEGRADED LANDSCAPES

The Project Site contains several sites that have been degraded by poor management of manufacturing processes, leakage of toxic waste, disposal of trash and debris, or have been altered by human activity to the degree that natural ecosystems are impacted. These site locations are identified on Map 9.

Cabot Carbon/Koppers Superfund Site

This site is 1.5 miles east of the Project Site. Activity at the site has contaminated the surficial aquifer and soil. Compounds found in the groundwater and soils include phenols, terpines, creosote, copper, chromium, and arsenic. Pentachlorophenol was also found in the soils.

Pollution, including elevated phenol levels, is apparent in the northern stretches of Hogtown Creek, with the water exhibiting an odor, slight color, and foam. Cabot Corporation and Beazer East, Inc. are currently designing EPA-approved methods for cleaning up the site. Within the coming year, it is anticipated that soil and groundwater remediation will begin. Further study is necessary to determine the downstream extent of contamination within Hogtown Creek, and the expected degree and timing of improvements to the creek due to the site remediation. (Source: Alachua Conservation Trust, 1992; Gainesville Department of Community Development, 1991; Beazer East, Inc., 1992)

Farmer's Mutual Exchange

A warehouse fire in 1984 contaminated soils and the surficial aquifer. Monitoring is currently underway to determine the condition of the aquifer in the area. (Source: Gainesville Department of Community Development, 1991)

Bailey's Branch/Gainesville Mall

This tributary of Hogtown Creek flows in a culvert under the parking lot of the Gainesville Mall, emptying into Hogtown Creek at Tax Parcel 9003-004-001. Bailey's Branch has been contaminated by a leaking underground storage tank from a gasoline station approximately 1/4 mile southeast of the Project Site. The source of the contamination has been terminated. A clean-up plan for the contamination has not yet been completed. (Source: Alachua Conservation Trust, 1992).

The Consulting Team also notes that a sizable amount of trash and debris has been discarded and washed from the Gainesville Mall parking lot, through a metal fence, and into Hogtown Creek. This trash includes more than 100 shopping carts, tires, and other assorted debris.

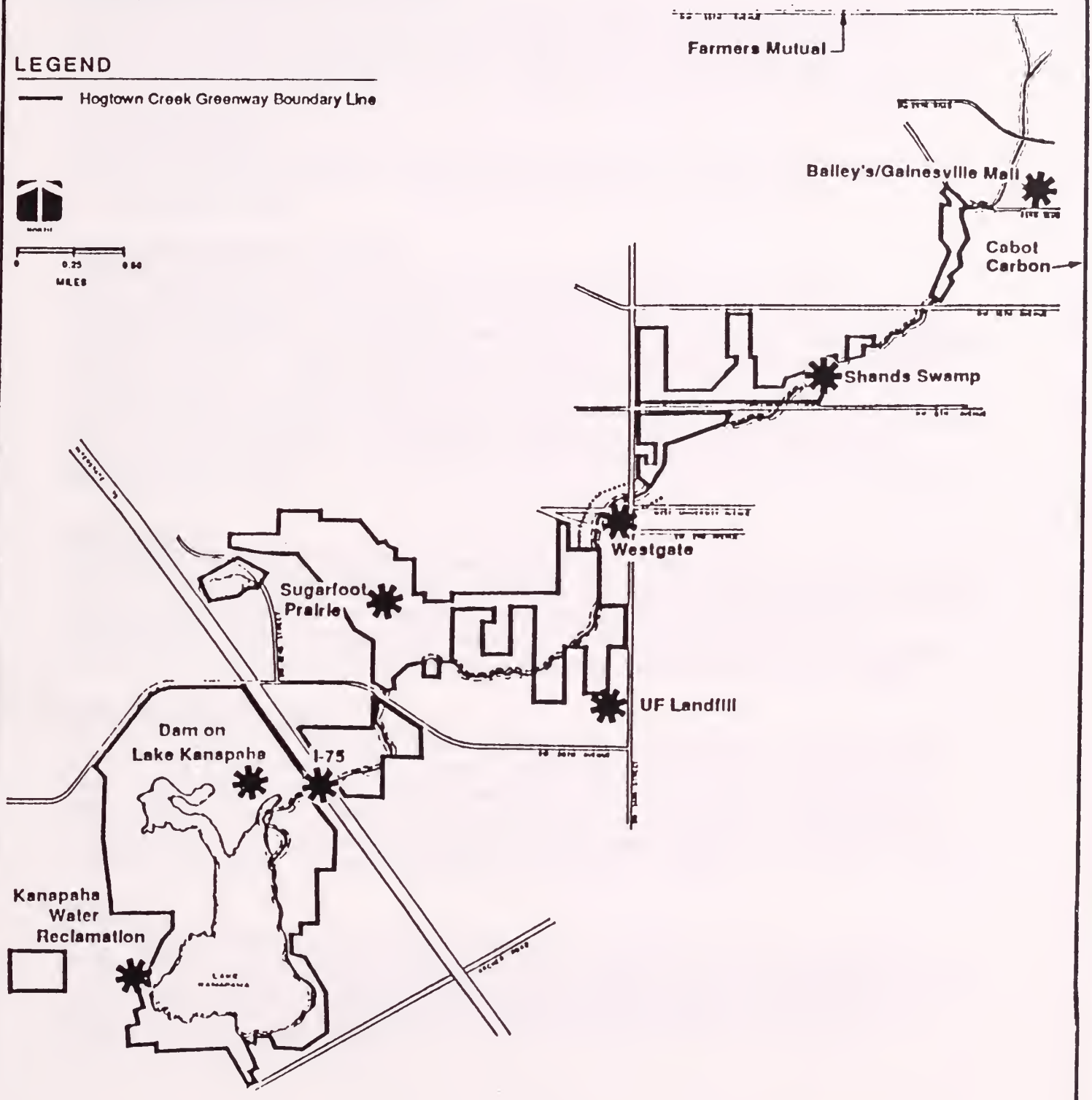
Shands Swamp

A field investigation in 1991 discovered the presence of a large accumulation of trash and debris just south of Raintree Subdivision on a City-owned Greenway property (Tax Parcel 6439-001-0000). The accumulation appears to be the result of deposition from upstream sources, and is probably non-hazardous. (Source: Gainesville Department of Community Development, 1992).

Potential and Known Pollution Sites

Hogtown Creek Greenway

Gainesville, Florida



MAP 9

Prepared by the
Department of Community Development
August 1992

Westgate Shopping Center Area
This shopping center is located in a filled section of the Hogtown Creek floodplain. The creek has been channelized and is in need of restoration. The City's stormwater management master plan for the creek proposes modifications for this area. (Source: Alachua Conservation Trust, 1992)

Sugarfoot Prairie
Sporadic dumping of trash has occurred at various locations near and within Hogtown Prairie. (Source: Gainesville Department of Community Development, 1992)

University of Florida Landfill
The University formerly operated a landfill west of the main campus. Contamination by several organic compounds (benzene, chlorobenzene, vinyl chloride, clomethane, and dichlorobenzene) has been detected at an upgradient off-site well. The Florida Department of Environmental Regulation (FDER) plans to conduct an investigation to determine the source of the contamination, and will then begin enforcement action against the responsible parties for remediation. A consultant retained by UF is implementing a groundwater monitoring plan (Source: Gainesville Department of Community Development, 1991)

Interstate 75
The interstate bisects Sugarfoot Hammock and crosses Hogtown Creek. It is a source of noise and air pollution, results in the death of thousands of animals each year by road kills, represents a visual eyesore, and contributes to degradation of water quality from surface runoff. The interstate is presently being widened from four to six lanes. (Alachua Conservation Trust, 1992)

Dam on Lake Kanapaha
In 1911, Hogtown Prairie was diked off from Lake Kanapaha. The stonework dam, which runs roughly east to west, is about five feet high at its highest point. Although much of the dam has fallen, the higher land under the dike still separates the two water bodies during low water periods. During high water periods, the dike does not impede water flow. There are no plans to alter or remove the dike. (Source: Dickinson and Wayne 1990)

Split Rock
There are a number of concrete and flint rock structures located around an active sink hole near Hogtown Prairie. They consist of steps, foundations, and walls which were apparently built in the early 20th century for recreational use. Their future and significance has not been determined. (Source: Dickinson and Wayne 1990)

Kanapaha Water Reclamation Plant

Gainesville Regional Utilities (GRU) operates the Kanapaha Plant on the western side of Lake Kanapaha. The Plant provides tertiary treatment to meet drinking water quality standards, and injects the treated effluent into the deep aquifer. The Plant has a permit to discharge excess effluent to Lake Kanapaha, which has occurred periodically in the past (Source: Alachua Conservation Trust, 1992). GRU has recently approved plans to divert a portion of the effluent to provide irrigation.

PROJECT GOALS

PROJECT GOALS

Based on the thorough evaluation of environmental and cultural features of the Project Site, the Consulting Team and Gainesville City staff worked with an appointed citizens advisory group, through a planning and design charette to define appropriate goals and objectives for the proposed Hogtown Creek Greenway. The following mission statement for the proposed greenway was developed by the Consulting Team and the citizens advisory group:

To preserve and protect the riparian lands and waters of Hogtown Creek through the development of a multi-objective community greenway system. The greenway will protect lands adjacent to the primary creek channel and on selected tributaries from further urban encroachment and development, will provide areas for stormwater management and flood control, will offer improved access to the unique environs of Hogtown Creek so that local residents and tourists can participate in passive recreation, environmental education and other appropriate social activities, will offer the community with a non-motorized north-south linkage that can serve alternative transportation purposes, and will promote economic redevelopment and revitalization of areas throughout west Gainesville.

The following goal statements, all of which were developed at the design charette with the exception of the Cultural Resource Goal which was suggested by the Division of Historical Resources, more clearly articulate the mission statement and vision for the Hogtown Creek Greenway.

ENVIRONMENTAL GOAL

To protect and improve the Hogtown Creek creek channel, her tributaries and flood prone areas from encroachment of incompatible uses and urban development. To establish policies and programs that preserve, restore and protect the ecological functions and sensitive species of the Hogtown Creek and its environment.

TRANSPORTATION GOAL

To establish an effective, continuous, multi-modal, non-motorized alternative transportation network for the Hogtown Creek Greenway and surrounding community.

RECREATION GOAL

To provide ecologically sound, accessible and appropriate recreation.

HEALTH AND FITNESS GOAL

To provide ecologically sound, accessible and appropriate opportunities for pursuit of health and fitness.

QUALITY OF LIFE GOAL

To provide a community commons where people can interact peacefully with each other and with nature.

PUBLIC ACCESS/PRIVACY GOAL

To provide the maximum public access possible to Hogtown Creek and its environs while maintaining appropriate protection for privacy and the environment.

SAFETY AND SECURITY GOAL

To provide a safe and secure recreation and transportation network for the people who use and live along the greenway, and the wildlife that inhabit greenway lands.

EDUCATION GOAL

To increase public awareness of the natural environment and the responsible use of such resources through public access and educational programming.

OPERATIONS AND MANAGEMENT GOAL

To ensure efficient and ecologically sound long term operations and management practices consistent with community greenway goals.

FINANCIAL GOAL

To ensure adequate on-going financial support in order to meet the goals and objectives of the greenway.

ECONOMIC DEVELOPMENT GOAL

To capitalize on and celebrate the quantitative and non-quantitative economic benefits of the greenway for the entire community.

CULTURAL RESOURCE GOAL

To protect and ensure professional interpretation of significant cultural resources.

PROPERTY ACQUISITION

PROPERTY ACQUISITION

The Hogtown Creek Greenway project is comprised of 64 parcels of land, forty-four of which remain to be acquired (See Map 10 and 11). According to the Alachua Conservation Trust (1992), there are three categories of properties that are to be acquired within the project study area: 1) vacant, developed land; 2) vacant land of marginal development value due to flood elevations or poor access; and 3) developed land that needs to be acquired to provide greenway connectivity.

The City of Gainesville and Alachua County have structured a "Multi-Party Acquisition Agreement" to pursue the land acquisition of required parcels of land. The Alachua Conservation Trust is under contract to provide certain services to the City and County to assist with acquisition. It is the objective of this project to acquire sufficient properties to ensure connectivity throughout the greenway. It is recognized, however, that not all properties will be acquired through this program due to the possibility of unwilling sellers, title problems, lack of sufficient funds, environmental problems, or other reasons. Some properties are crucial to acquire for the viability of the project, while others are less essential (See Map 11).

Some parcels are proposed to be acquired in fee simple, while a less than fee interest, such as an easement, may be acquired on other parcels. The FCT grant application recommends an "interest to be acquired" for each parcel. However, the ownership of these properties may change in the process of negotiating for each parcel.

The value of some parcels to the greenway project may not adequately be reflected using the appraisal requirements of 18-1.006, F. A. C. Therefore, certain parcels may be acquired using alternative valuation methods, and will be donated to the State consistent with Section 253.025, F. S. after they have been acquired by ACT or the City.

The following criteria have been generally used to establish priorities for greenway parcel acquisition:

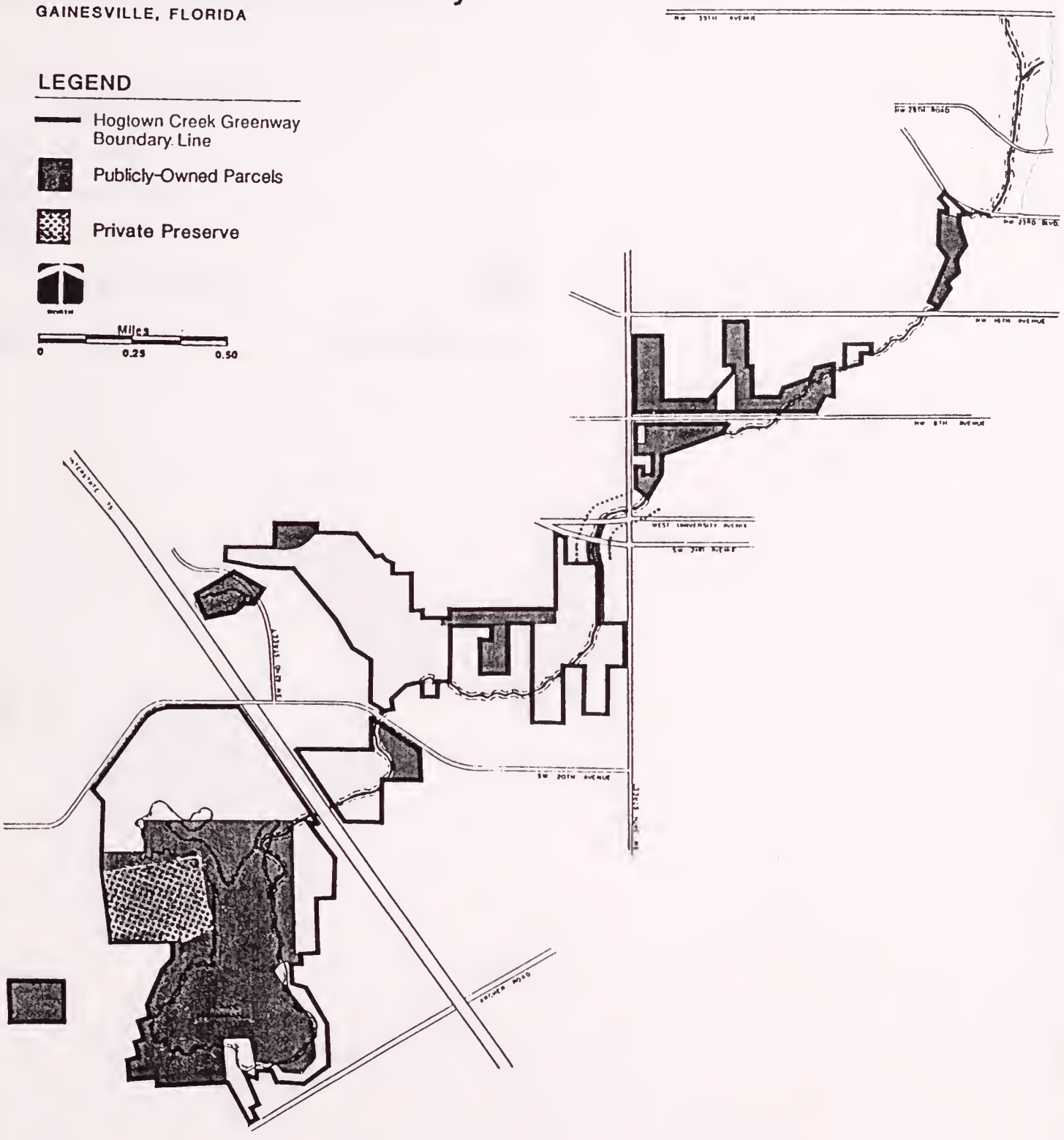
Willing Seller - These persons increase the likelihood that a parcel can be acquired under terms that are favorable to the greenway manager. Unwilling sellers typically extract exorbitant concessions or selling prices for their property.

Outstanding Feature(s) - Parcels which possess outstanding features such as significant natural areas or important historical structures can play an important role in giving a greenway an identity, and increase the popularity of the greenway. Also, acquiring such parcels increases the likelihood that the significant features on the parcel will be restored and/or preserved for future generations.

Publicly-Owned Parcels

Hogtown Creek Greenway

GAINESVILLE, FLORIDA



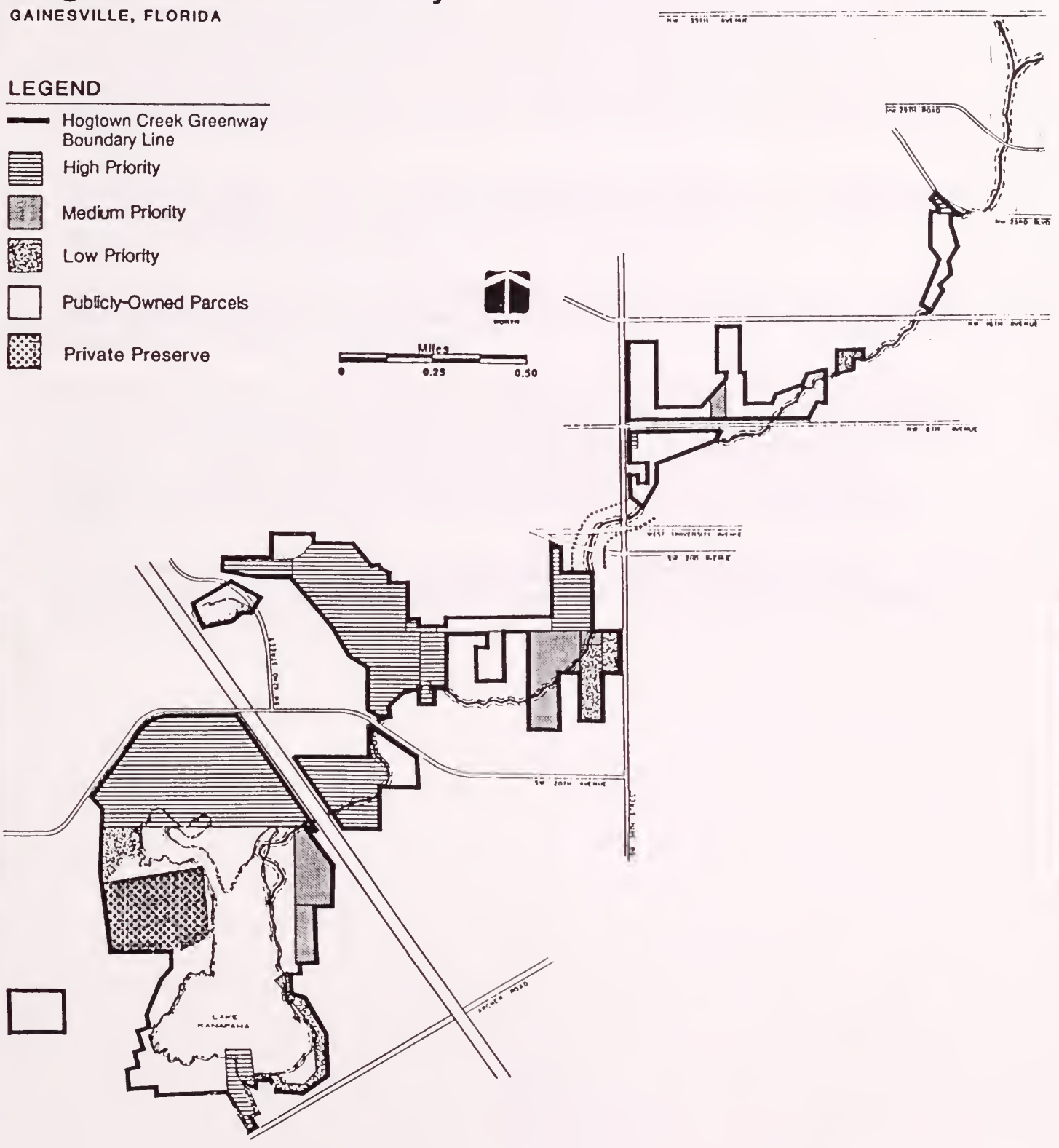
MAP 10

Prepared by the
Department of Community Development
August 1992

Priority Parcel Acquisitions

Hogtown Creek Greenway

GAINESVILLE, FLORIDA



MAP 11

Prepared by the
Department of Community Development
August 1992

Linkage - Parcels that physically link existing greenway segments, or provide lateral links to important sites such as schools, residential and commercial areas, and environmentally significant areas, are extremely important in achieving the continuity objective of greenways. Continuity enhances wildlife habitat (by providing wildlife corridors linking larger habitats) and trail establishment (by allowing the greenway trail to avoid relatively dangerous and inconvenient road by-passes).

Development Threat - Parcels that are threatened by development incompatible with the greenway (or are a threat to general environmental conservation objectives) should be prioritized.

Multiple Use - Parcels that potentially provide multiple public benefits without causing such problems as environmental degradation or negative impacts to a neighborhood, should be prioritized.

Following acquisition, the property will be subject to a detailed environmental survey (including plant, animal, and habitat inventories) to establish baseline conditions and additional information to determine the appropriate use of the property. In addition, a surveyor will be employed to establish property boundaries and other features such as flood elevations, and utility and road rights-of-way and easements.

This Master Development and Management Plan offers a listing of those properties prioritized for acquisition by the Multi-Party Acquisition Agreement and subsequent Acquisition Plan.

RECOMMENDED GREENWAY FACILITIES

RECOMMENDED GREENWAY FACILITIES

In order to develop the Hogtown Creek Greenway in a manner that meets the goals and needs of the community, the City will proceed with development of the following facilities. These facilities represent a compilation of the "Preferred Design Concept" that was generated by design charette participants in April 1993 (See Map13, page 111).

NW 23RD AVE., AT GAINESVILLE MALL, TO ELKS CLUB LODGE

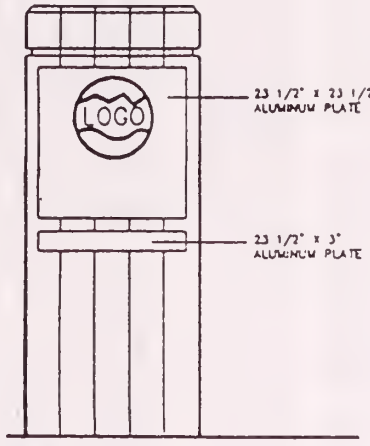
This segment of the greenway is proposed to extend westerly along NW 23rd Avenue from the Gainesvillle Mall Activity Center, across the bridge at Hogtown Creek to the Elks Club Lodge. Currently, this road does not have proper signage, appropriate improvements for cycling, or contiguous sidewalk facilities on the south side of NW 23rd Avenue that interlinks with the Elks Club Lodge. On-street bicycle facilities will be a long term objective for the County along this segment of the road. In the short term, the bike route and greenway logo signs, as well as the extension of sidewalks, will be installed from the Elks Club Lodge to the Gainesville Mall Activity Center in order to provide safe passage between these two destination points of the proposed greenway corridor.

As the intersection of NW 23rd Avenue and NW 16th Street is a controlled intersection, it is the most logical point to cross the roads for accessing the Elks Club Lodge or the Gainesville Mall.

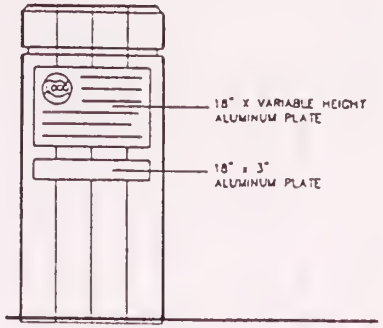
One of the most challenging aspects of this segment of the proposed greenway will be the needed acquisition of the Elks Club Lodge. This facility offers the City an opportunity to establish one of the greenway's trail heads that could provide cultural and environmental education programs, as was suggested during the Design Charette. The City is presently researching the structural condition of the buildings, demolition of the concrete pools surrounding Glen Springs, restoration of Glen Springs to its natural landscape, and the potential uses that the facilities could accommodate. These forms of improvements will require a financial commitment that is beyond the immediate scope of this project, and will be a long term objective for the City.

In the interim, the Lodge will provide the City with parking, restrooms, pedestrian access to Alfred A. Ring Park and possibly serve as a greenway information center and/or headquarters for greenway maintenance personnel. The Lodge presently has approximately 80 parking spaces that will offer community residents, who do not live close enough to bike or walk to the greenway, with a northern point of access to the greenway system and Alfred A. Ring Park. Signs will be utilized at all trail heads and throughout the greenway for directional, regulatory and informative purposes (See Figure 1).

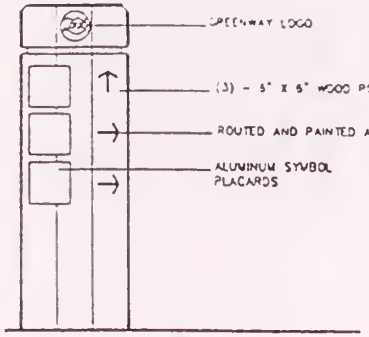
Environmental restoration of the Elks Club Lodge landscape and the historic Glen Springs is required, irrespective of the decision to leave the buildings and structures intact.



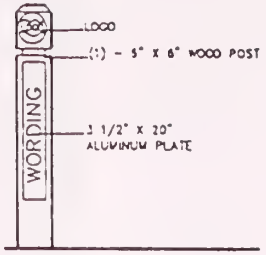
Major Entry



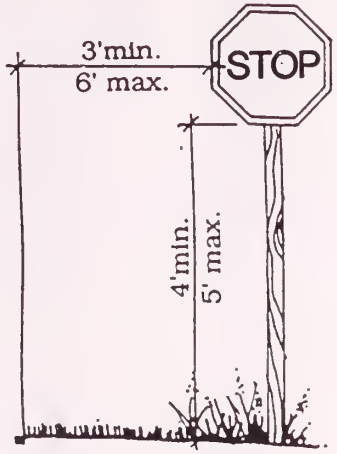
Minor Entry



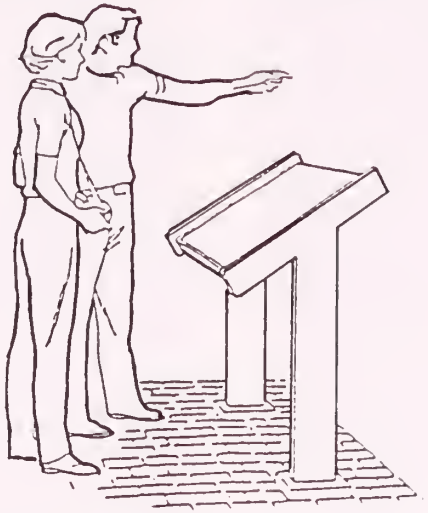
Directional



Bollard



Pole/Post Regulatory



Wayside Exhibit (NPS Standards)

FIGURE 1

TYPICAL SIGNAGE DEVELOPMENT

GHS TO ELKS CLUB LODGE VIA NW 23RD AVENUE

The Team notes that proposed greenway facilities along NW 23rd Avenue will establish a proposed connection to the Gainesville High School, via the existing facilities located along NW 16th Avenue. The greenway trail system will then offer students with a choice in travel from their neighborhood to school, serving a transportation function. Signs will be needed to direct students from the high school to greenway facilities. Additional greenway parking might also be available at the high school, and the Team recommends that the City negotiate necessary agreements to obtain access and use of appropriate parking spaces.

GAINESVILLE HIGH SCHOOL TO ALFRED A. RING PARK

From the High School to Ring Park, the Team notes that although sidewalks are provided along the north side of NW 16th Avenue to Ring Park, signs will be provided to direct students to the park and greenway system.

ALFRED A. RING PARK

The preferred design development approach for Ring Park includes a pedestrian only trail system through the park (See Figure 2, 3 and 4), as is presently developed. All connections to the park will support the pedestrian only designation, especially at NW 16th Avenue, where children on mountain bikes tend to access the park for recreational pursuits. A pedestrian/bicycle connection will need to be made to the Elks Club Lodge via the existing bridge spanning Glen Springs Run, to link travel and activities between these facilities.

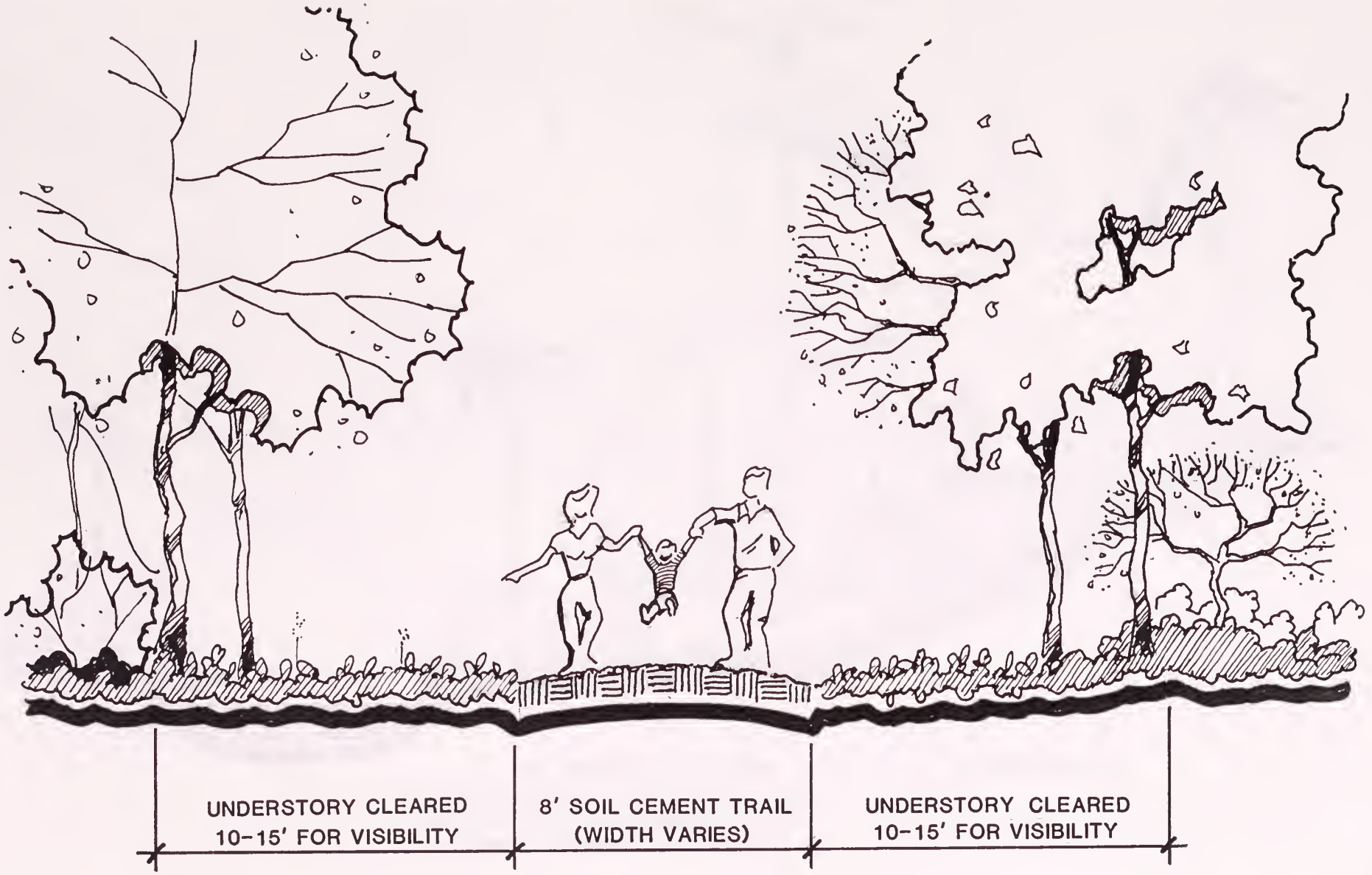
ELKS CLUB LODGE TO NW 22ND ST. VIA NW 23RD AVE. R.O.W.

In order to interlink the Elks Club Lodge with Alfred A. Ring Park and the neighborhoods to the west, several improvements will have to be made for safety, security and access management purposes. From the Elks Club Lodge parking facilities a combination of multi-use trail (See Figure 5) and boardwalk (See Figure 6) facilities will have to be provided to connect with the existing Glen Springs Run bridge. At this point, railings will be required for the bridge. These railings will also need to be extended approximately 25 feet to the north and south of the bridge to provide safety and access control to the Glen Springs Run. From the south side of the bridge to the pedestrian entrance of Alfred A. Ring Park and to the park's NW 22nd Street entrance, via NW 23rd Avenue right-of-way, the existing mulch trails will be improved to the10-foot wide, multi-use, off-road asphalt trail.

This will enable trail users to utilize existing on-road and sidewalk facilities to interlink the Elks Club Lodge and Ring Park to those greenway parcels to the south and southwest.

NW 16TH AVENUE TO NW 8TH AVENUE

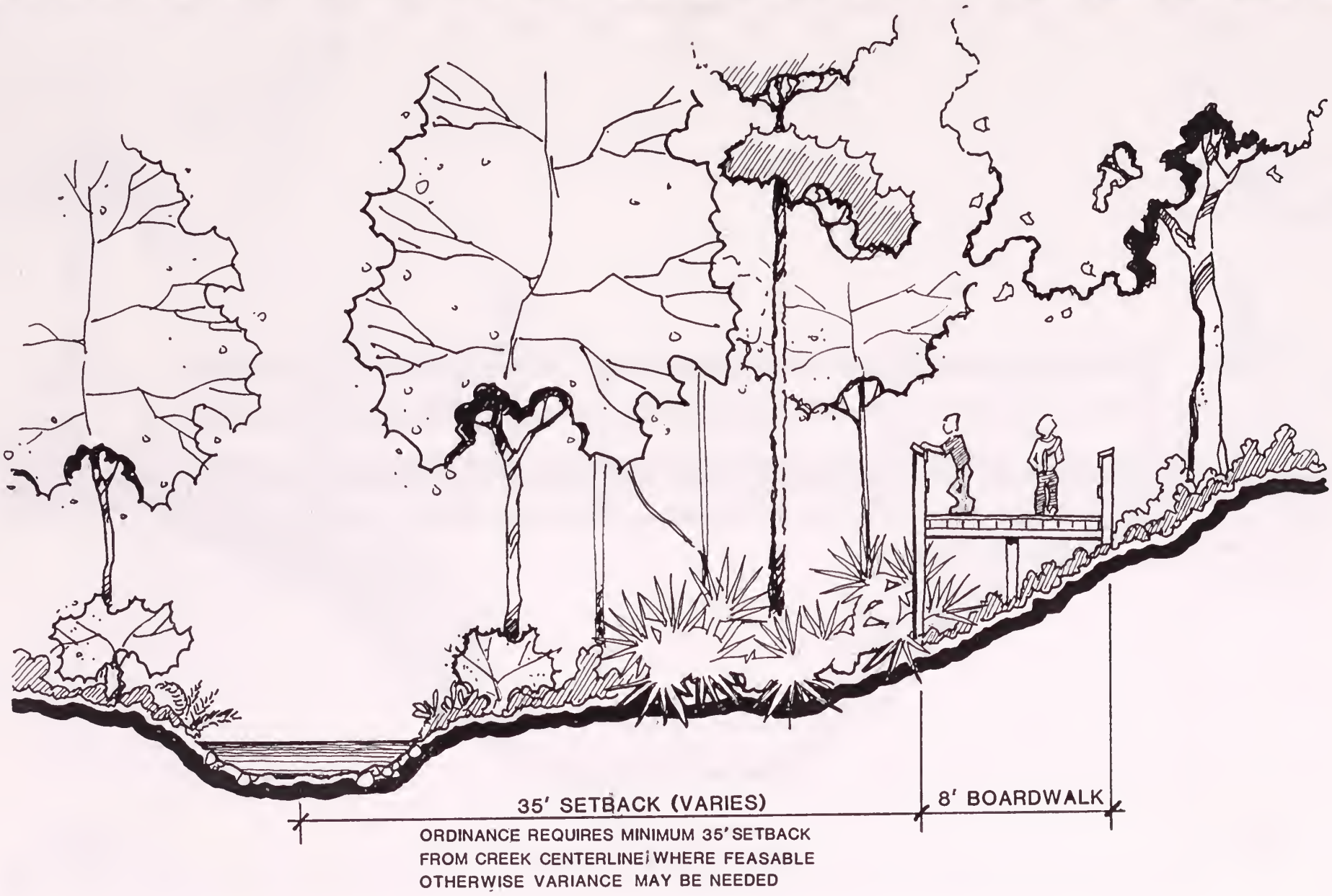
The segment of the proposed trail that begins at the intersection of NW 16th Avenue and Possum Creek will be accessed by the existing sidewalk facility located on NW 16th Avenue. Both the City and County Departments' of Public Works will require trail users to access this portion of the trail by utilizing the



TYPICAL SOIL CEMENT PEDESTRIAN TRAIL

SCALE: 1/4"= 1'-0"

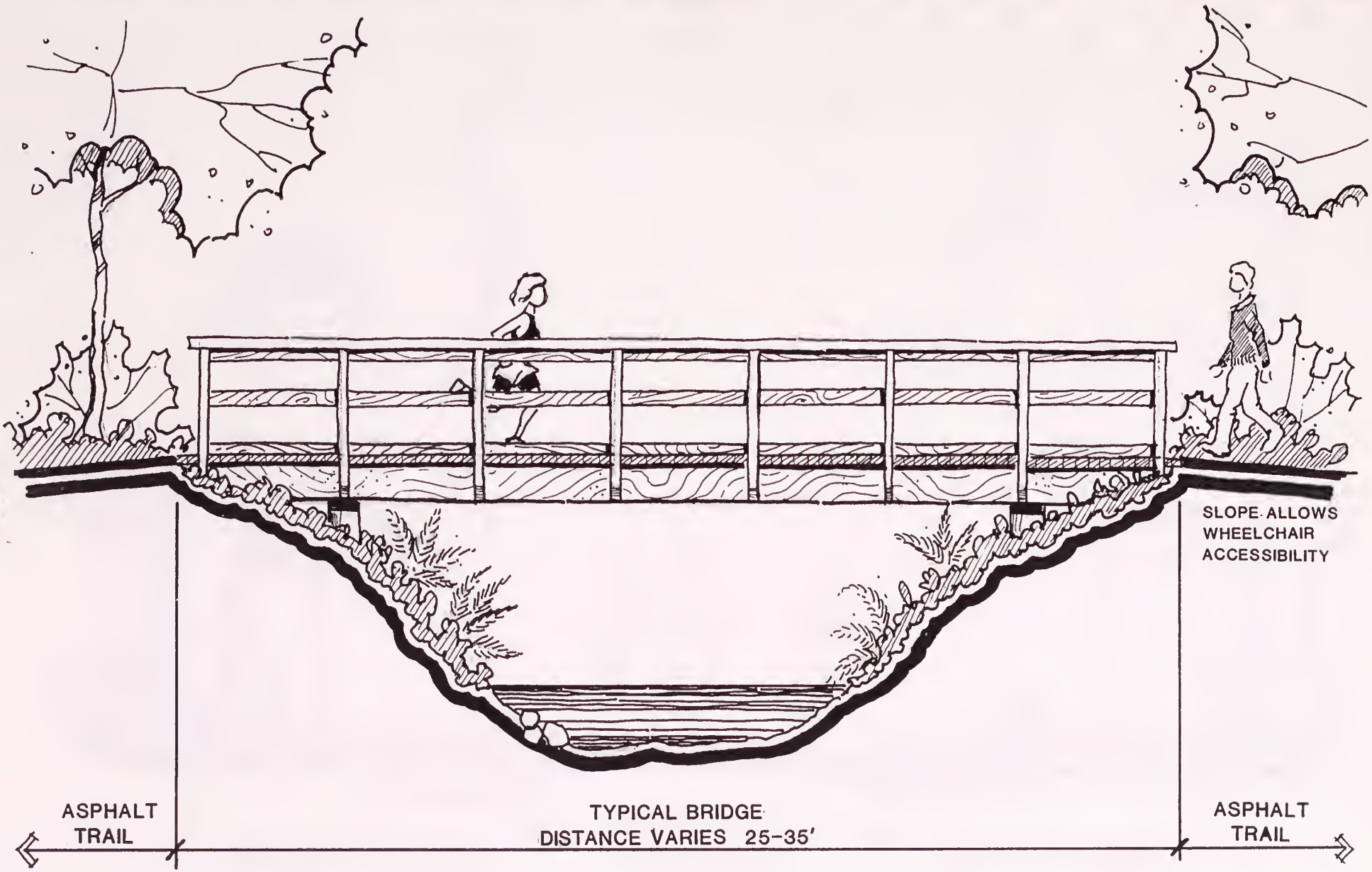
FIGURE 2



TYPICAL PEDESTRIAN BOARDWALK

SCALE: 1/8" = 1'-0"

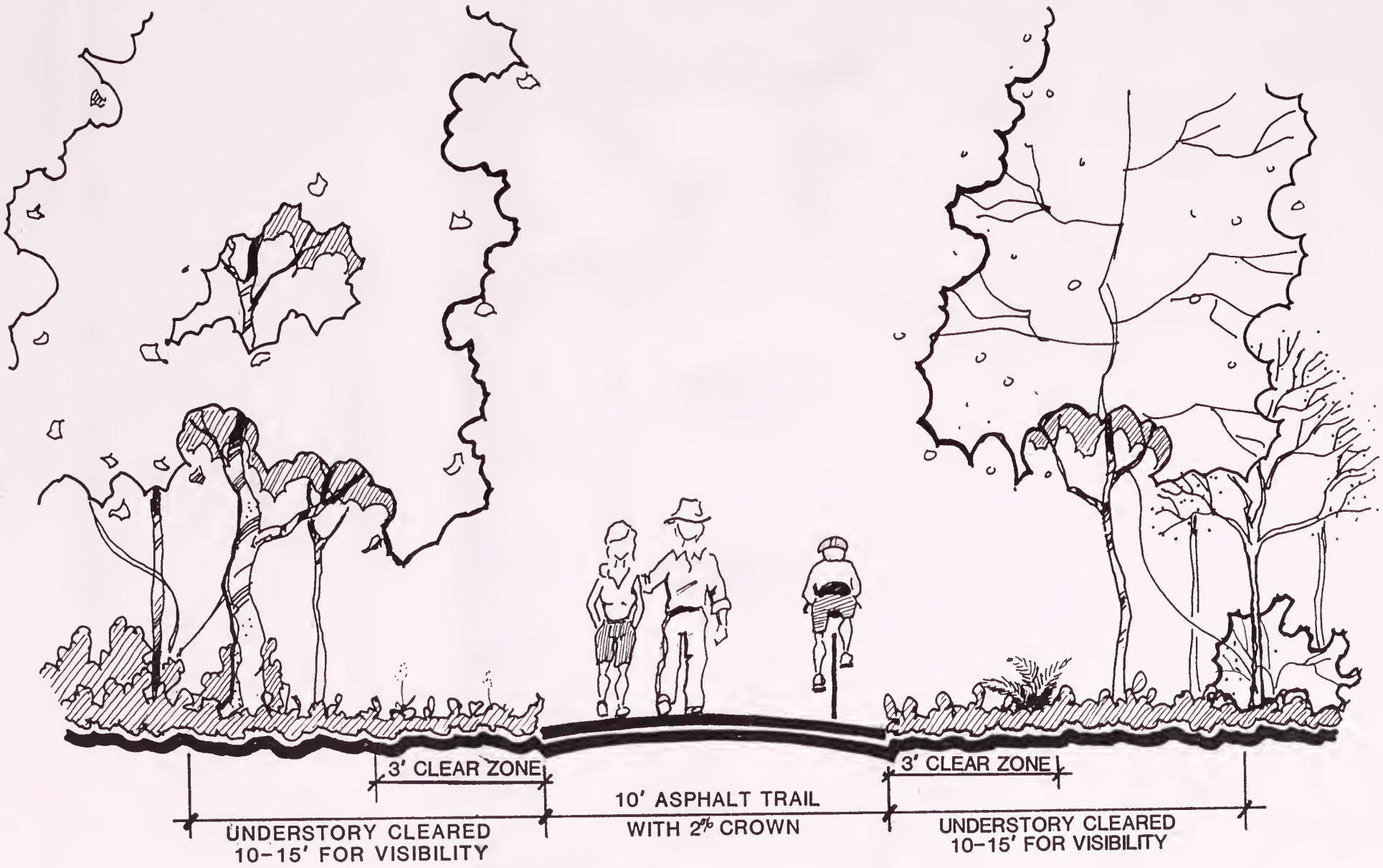
FIGURE 3



TYPICAL PEDESTRIAN BRIDGE

SCALE: 1/4" = 1'-0"

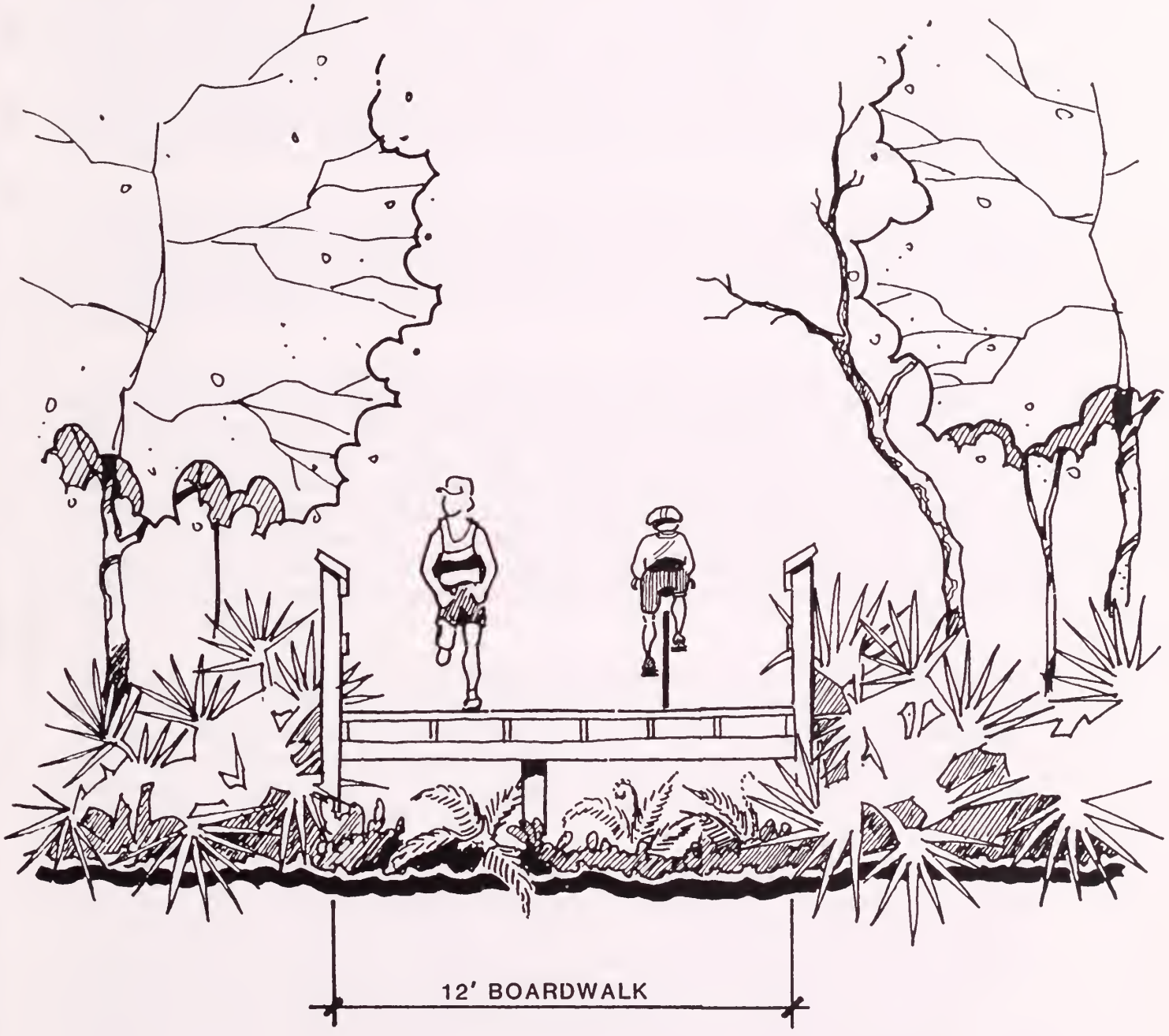
FIGURE 4



TYPICAL MULTI-USE TRAIL

SCALE: 1/4" = 1'-0"

FIGURE 5



TYPICAL MULTI-USE BOARDWALK

FIGURE 6

SCALE: 1/4" = 1'-0"

existing sidewalk on the south side of NW 16th Avenue, via the at-grade crossings at the signalized intersections of NW 22nd Street and NW 34th Street. Once the trail is accessed from NW 16th Avenue, the trail system once again becomes a 10-foot wide, multi-use off-road asphalt trail, and meanders through the Possum Creek Open Space. This trail will follow the existing sanitary sewer easement, which is already cleared and is presently used by local residents. At the intersection of the sewer line and tributary streams of Possum Creek, the trail surface will need to be elevated either on a series of 12-foot wide, multi-use boardwalks, or if permitted, on earthen fill (See Figure 6).

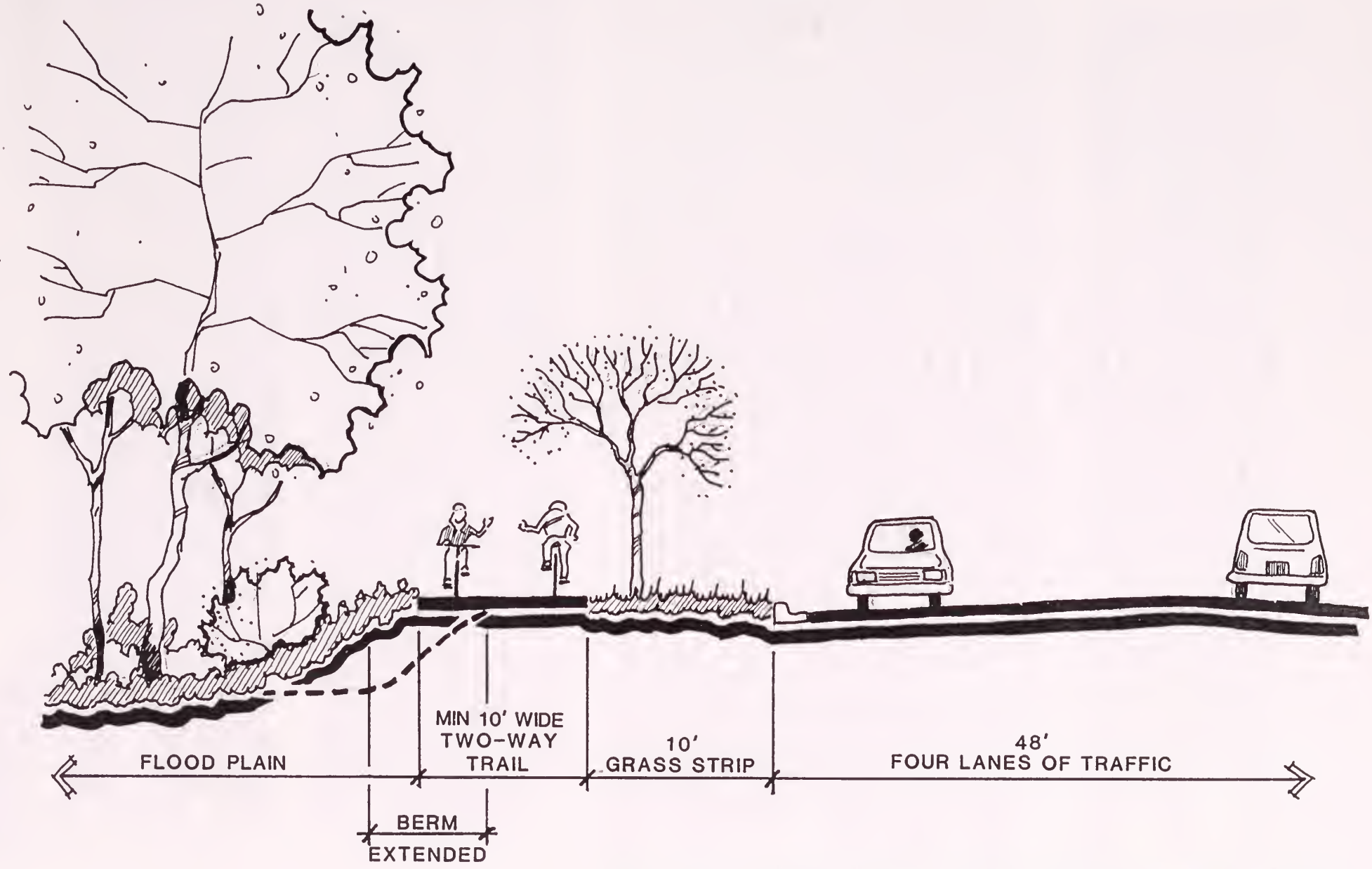
Continuing south, the multi-user trail will incorporate neighborhood trail connections to the Tanglewood Subdivision to the east and eventually intersect with the existing sidewalk facility located on the north side of NW 8th Avenue. At this intersection the existing sidewalk offers east/west travel along NW 8th Avenue (See Figure 7).

Greenway facility development within the Possum Creek Open Space provides an opportunity to implement extensive environmental restoration of the floodplain landscape. This landscape is presently degraded by uncontrolled access and public use. Additionally, upstream urbanization of the Possum Creek watershed has resulted in deterioration and pollution of the main channel. The riverine configuration through this open space is braided as a result of constant flooding. Drainage culverts under NW 8th Avenue serve to impound stormwater in the open space, and downstream neighbors, south of NW 8th Avenue, are not supportive of an expansion of these culverts to permit improved stormwater flows.

The City, along with its Public Works Department, will work extensively with the University of Florida and state agencies to define a design and management strategy for making improvements to this open space landscape. Stormwater detention facilities, in conjunction with habitat restoration, and greenway trail development could result in a re-ordering of public use and eventual restoration of this landscape.

ALONG NW 8TH AVENUE TO NW 34TH STREET

The Team has carefully considered all of the design options that are available for this segment of the greenway corridor. We are proposing that a two-way, off-road multi-use trail be constructed on the north side of NW 8th Avenue from Hogtown Creek to NW 34th Street (See Figure 7). This will require the extension of the box culverts under NW 8th Avenue to span Possum and Hogtown Creeks. This facility will intersect with the following proposed multi-use trails that extend northward to NW 16th Avenue and NW 22nd Street: 1) the trail extending into the Tanglewood subdivision neighborhood at NW 25th Terrace which extends to NW 16th Avenue, and 2) the combined boardwalk and trail system that extends through the Possum Creek Open Space to NW 16th Avenue. In addition, the City will examine the possibility of installing a wildlife-only underpass beneath NW 8th Avenue to facilitate safe passage of small mammals and other floodplain wildlife from the Possum Creek Open Space to destinations south of NW 8th Avenue.



NW 8th AVE TWO-WAY MULTI-USE TRAIL

SCALE: 1/8"=1'-0"

FIGURE 7

Since the completion of the Design Charette, an alternative design option to the NW 8th Avenue connection has been discussed for the purpose of enhancing the trail user's experience. This option primarily involves maintaining the existing sidewalk along NW 8th Avenue, but includes linking it to a multi-use boardwalk trail facility that will be located in the forest vegetation, approximately 100 to 200 feet north of NW 8th Avenue. This facility will, also, intersect with the three northbound trails as described in the preceding paragraph. Further analysis of this option could be developed during the implementation phase of this area.

In order to continue south along the greenway, trail users will need to cross NW 8th Avenue at NW 34th Street intersection (See Figure 8). This is presently a controlled intersection, which also offers convenient access to Littlewood Elementary School. A potential crossing was evaluated at NW 31st Street, but due to lack of signalization at this time, it does not provide the safety benefits of the NW 34th Street intersection, even though that intersection has one of the highest accident rates in the City. Although it is recommended that people use the signalized intersection to cross NW 8th Avenue, there will still be the problem of people making mid-block crossings in non-designated crossing areas, primarily east of NW 31st Street. Because of the long "gap" time required to cross the road, and the characteristic high speed of automobiles using the road, crossing NW 8th Avenue at non-designated areas creates a potentially dangerous situation for trail users and motorists. Failure to offer the best crossing could increase the liability associated with this intersection and unnecessarily expose the City to additional risks. Currently, the City staff is researching the possibility of providing additional traffic signalization for NW 8th Avenue, other alternative means of providing access across NW 8th Avenue and controlling the speed of traffic.

A potential underpass or overpass was evaluated for the NW 31st Street intersection; however, the at-grade option is being pursued until trail use increases to the point that conflicts warrant a re-evaluation of the crossing. It may then be easier to justify the expense of an overpass or underpass. This area also provides the opportunity for additional public parking for potential users who do not live close to the trail. Westside Park will serve as a trail head for the greenway. It currently provides enough parking to accommodate the greenway's projected demand. Overflow parking will be available on the weekends at Littlewood Elementary School. Clear signage will be installed throughout this area to guide movement and inform users of the hazards of illegal crossing of NW 8th Avenue.

NW 34TH ST. TO LOBLOLLY ENVIRONMENTAL ED. FACILITY

From the intersection of NW 34th Street and NW 8th Avenue, the trail system will continue south as an off-road, multi-use asphalt trail and boardwalk system, between the western bank of Possum Creek and rear property lines of homes that front on NW 34th Street. This is a challenging landscape for trail development for a number of reasons. First, stormwater is normally impounded in a sizable wetland area, making it difficult to achieve a surface trail system. Second, private properties are relatively close to western bank of Possum Creek, meaning that routing options are limited. Finally,

PREFERRED SITE PLAN FOR LOBLOLLY AREA

Hogtown Creek Greenway

GAINESVILLE, FLORIDA

LEGEND

- Hogtown Creek Greenway Boundary Line
- Multi-Purpose Trail
- Boardwalk

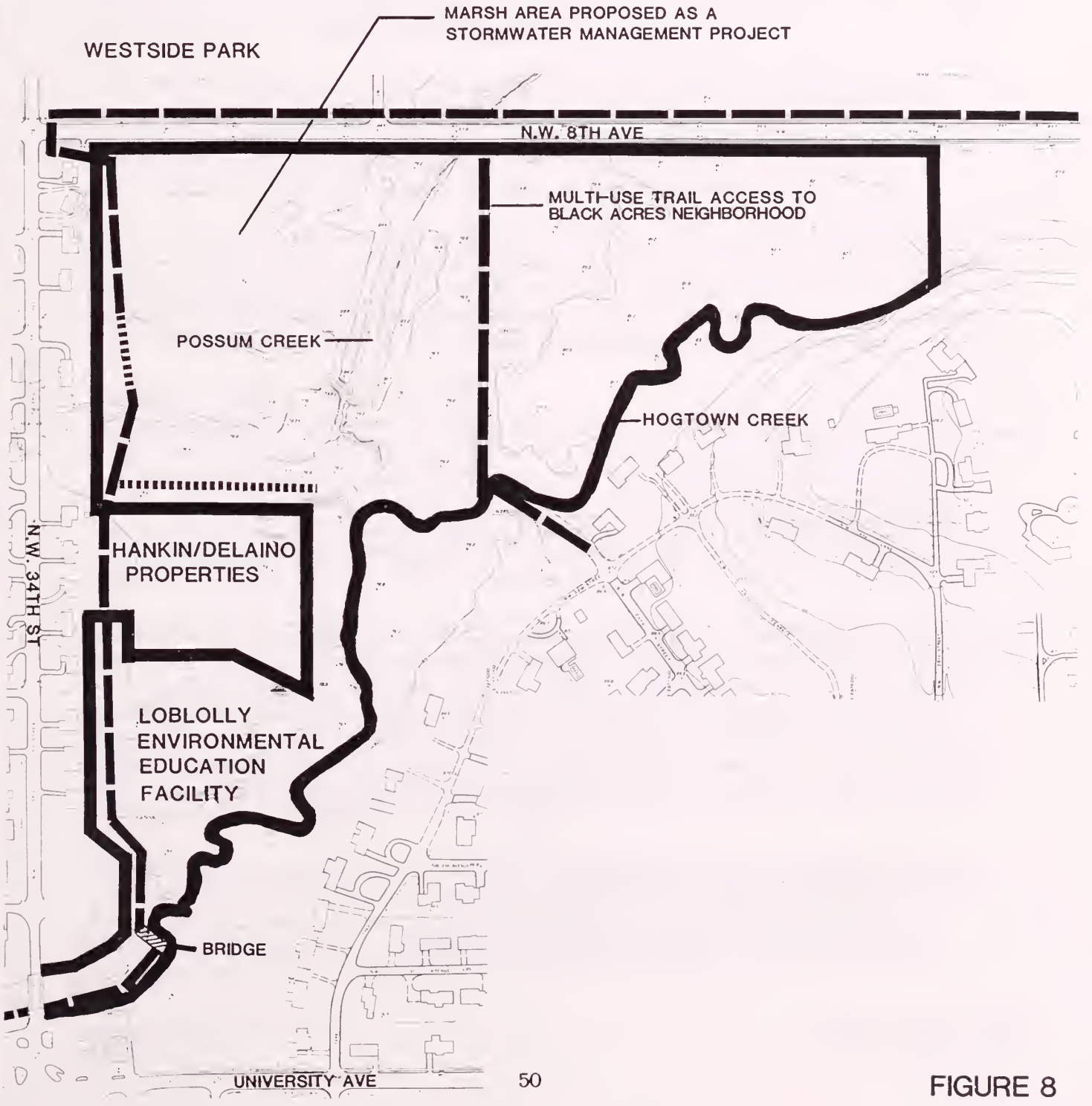


FIGURE 8

environmental sensitivity requires that trail development be balanced with restoration to ensure successful greenway implementation.

As a result of the Design Charette, local property owners in this section (Hankins and Delaino) are currently negotiating with the Alachua Conservation Trust to sell their property to the City for greenway purposes. This sale would greatly improve the ability to achieve multiple objectives in this area. It allows the trail to be routed west of the creek channel, toward higher ground. The sale would enable the City to develop a proposed stormwater detention facility south of NW 8th Avenue and west of Possum Creek, which may result in a reduction in the size and location of detention berms along Hogtown Creek. Finally, the Team feels that this sale would permit a better connection to the Loblolly Environmental Education Facility, the next public facility along the proposed greenway route.

As a major component of greenway facility development, a comprehensive program of environmental restoration will need to accompany facility development through this segment. This area has been degraded by abundant off-trail use, and it is expected that the designated greenway trail will encourage the majority of users to stay on the multi-user trail tread.

At the Loblolly Environmental Education Facility, the trail will be routed so that it provides appropriate access to and through the facility. Some public parking, approximately 5 spaces, will be made available to serve the Center. In addition, the Gainesville Regional Transit System will be encouraged to provide a connection with the greenway at the regular stop near the Center.

BLACK ACRES BIKE PATH

An existing bicycle/pedestrian path links local residents with the existing sidewalks along the south side of NW 8th Avenue. A formal trail connection will need to be developed along NW 8th Avenue to improve this linkage. Additionally, improvements will be made to the trail surface and drainage structures along this pathway (See Figure 9). These improvements will be provided through the development of a multi-use trail which will reduce trail maintenance and increase the pathways tread life.

LOBLOLLY ENVIRONMENTAL ED. FACILITY TO WESTGATE S. C.

From the Loblolly Environmental Education Facility, the trail continues south to Westgate Shopping Center. The Alachua Conservation Trust is currently working with owners of the Creekside Apartments to acquire land for the greenway trail. Trail development will require the installation of a 12-foot wide by 60-foot long bridge across a stormwater detention weir (See Figure 8 and 10). Trail development will then be located on the southeast side of Hogtown Creek and connect with NW 34th Street.

In addition, a comprehensive program of restoration will be required for the Hogtown Creek channel through this segment. Prior channelization of the creek bed has resulted in siltation and overgrowth of weeds and aquatic vegetation. The City has proposed restoration as part of the stormwater management plan for this area.

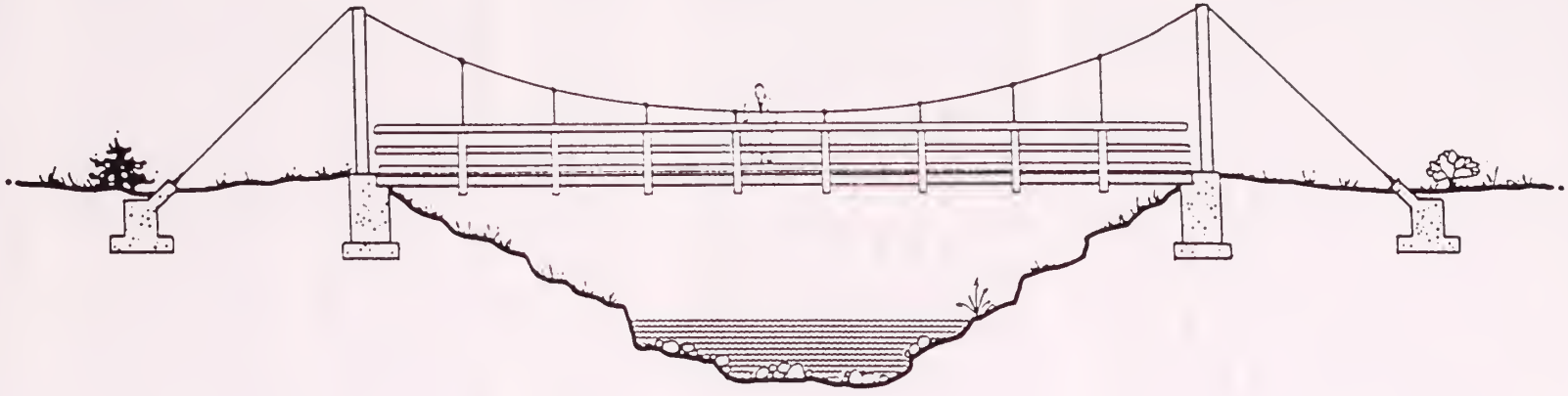


FENCING AND/OR VEGETATIVE BUFFER USED FOR
ACCESS MANAGEMENT, SECURITY, AND PRIVACY

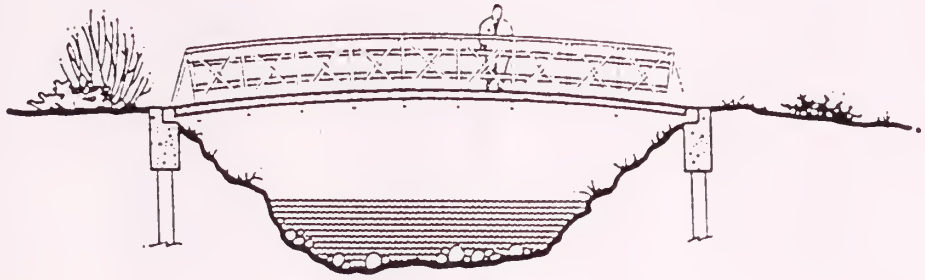
BLACK ACRES NEIGHBORHOOD MULTI-USE TRAILS

FIGURE 9

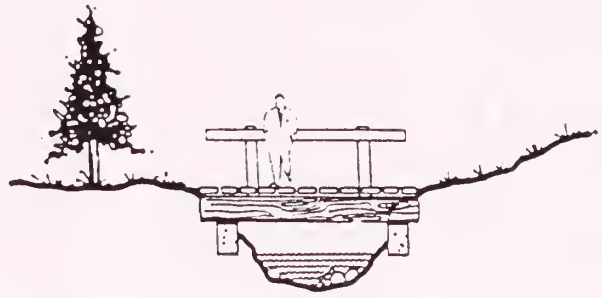
NO SCALE



Suspension Bridge



Prefabricated Cor-ten Steel Bridge



Log Footbridge

FIGURE 10

TYPICAL BRIDGE DETAILS

WESTGATE SHOPPING CENTER TO CREEKSIDE MALL

At the intersection of NW 34th Street and Hogtown Creek, the trail will be routed beneath the existing roadway bridge, and up onto the south side of the channel, behind the commercial establishments in the Westgate Shopping Center (See Figure 11). Utilizing bridge underpasses as part of the trail system will require the establishment of additional security measures, such as installation of vandal-proof lighting and paint, provision of visual clear zones and elimination of any potential hiding or transient living spaces. Signs will be posted to indicate that the underpasses will be closed during heavy rains and to instruct users to use the controlled intersections to cross University Avenue, NW and SW 34th Street and SW 2nd Avenue. However, when heavy rains are not occurring the users will be discouraged from using the at-grade crossings. There are several available parking areas within the Center for greenway users. Due to the ease of access to the Project Site, it is probably unnecessary to designate specific areas for greenway parking within this segment of the proposed trail.

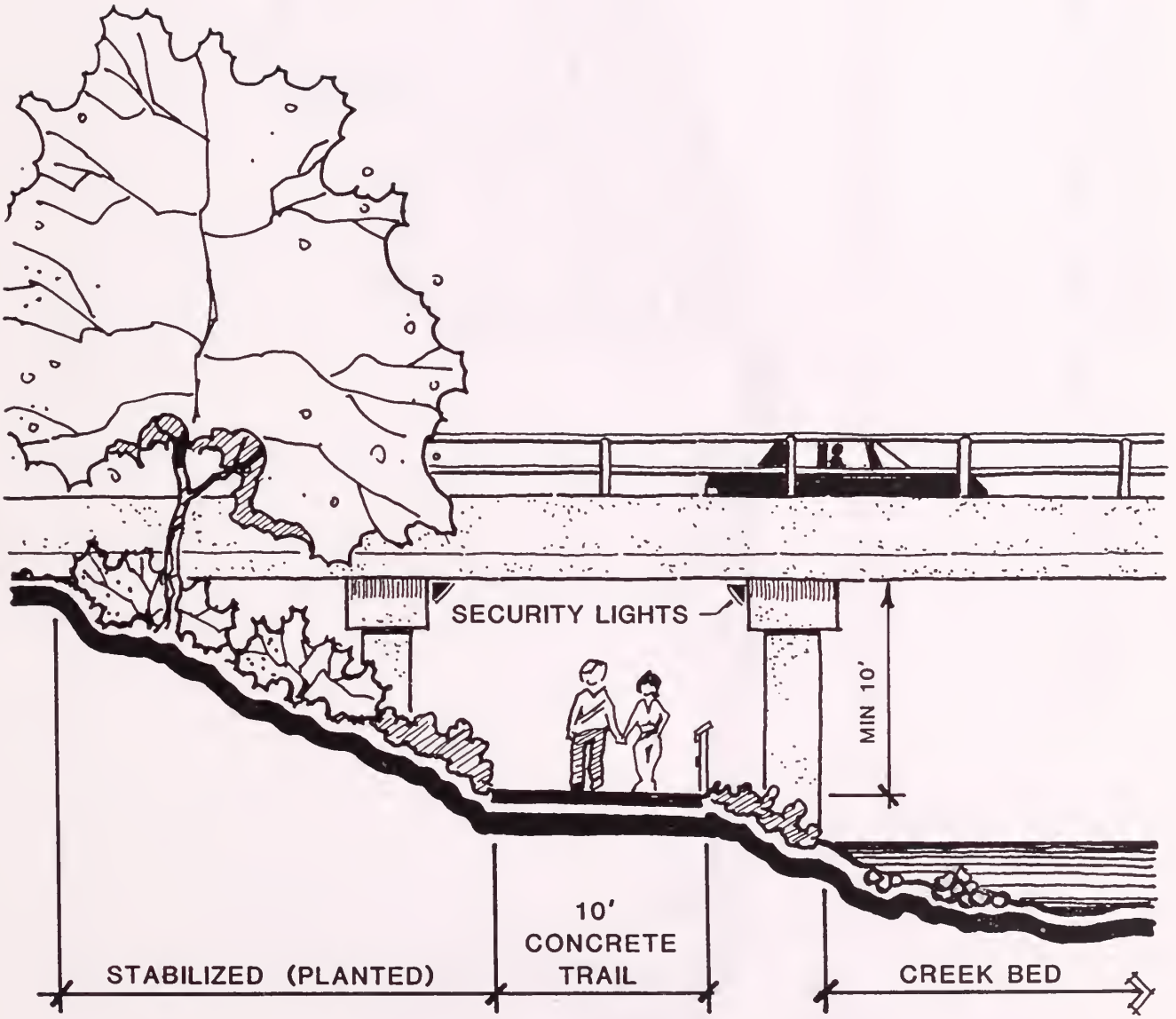
From NW 34th Street, the trail will become a pedestrian/bicycle promenade, and it is hoped that re-development of the Westgate Shopping Center would occur so that buildings could be oriented toward Hogtown Creek. The promenade remains on the south and east side of the creek through the shopping center, under the University Avenue and SW 2nd Avenue bridges. At this point the trail will extend southerly along the east side of the Creek to provide access to the existing apartment complexes adjacent to the Creek and to establish a linkage to the University of Florida. In addition, the trail will cross Hogtown Creek over to Creekside Mall where the trail will continue southwest to Green Acres Park along a 10-foot wide multi-use trail (See Figure 12).

The concept of linking the trail system with Westgate Shopping Center provides an opportunity for economic re-development of the shopping center, and could create a popular destination point for local residents.

CREEKSIDE MALL TO NW 34TH ST. @ UNIV. OF FLORIDA

South of Creekside Mall, the trail forks, with one leg heading south to Green Acres Park, and the other heading east to the University of Florida Campus. The latter is an important connection for students who live west of the campus, by offering opportunities for non- motorized, safe alternative transportation.
This trail will be a 10-foot wide multi-use asphalt tread that extends south and intersect with a 12-foot by 50-foot long bridge that spans the Hogtown Creek channel to the west, thereby, providing a linkage to the University. The Team also recognizes that the presence of wetland landscape along this route means that a boardwalk system may be required to provide this connection in an ecologically sensitive manner (See Figure 6, page 46).

This spur trail will terminate on SW 34th Street, either at Radio (Farm) Road, if appropriate, or simply at its connection with the sidewalks on SW 34th Street.



TYPICAL BRIDGE UNDERPASS FOR MULTI-USE TRAIL

SCALE: 1/8"=1'-0"

FIGURE 11

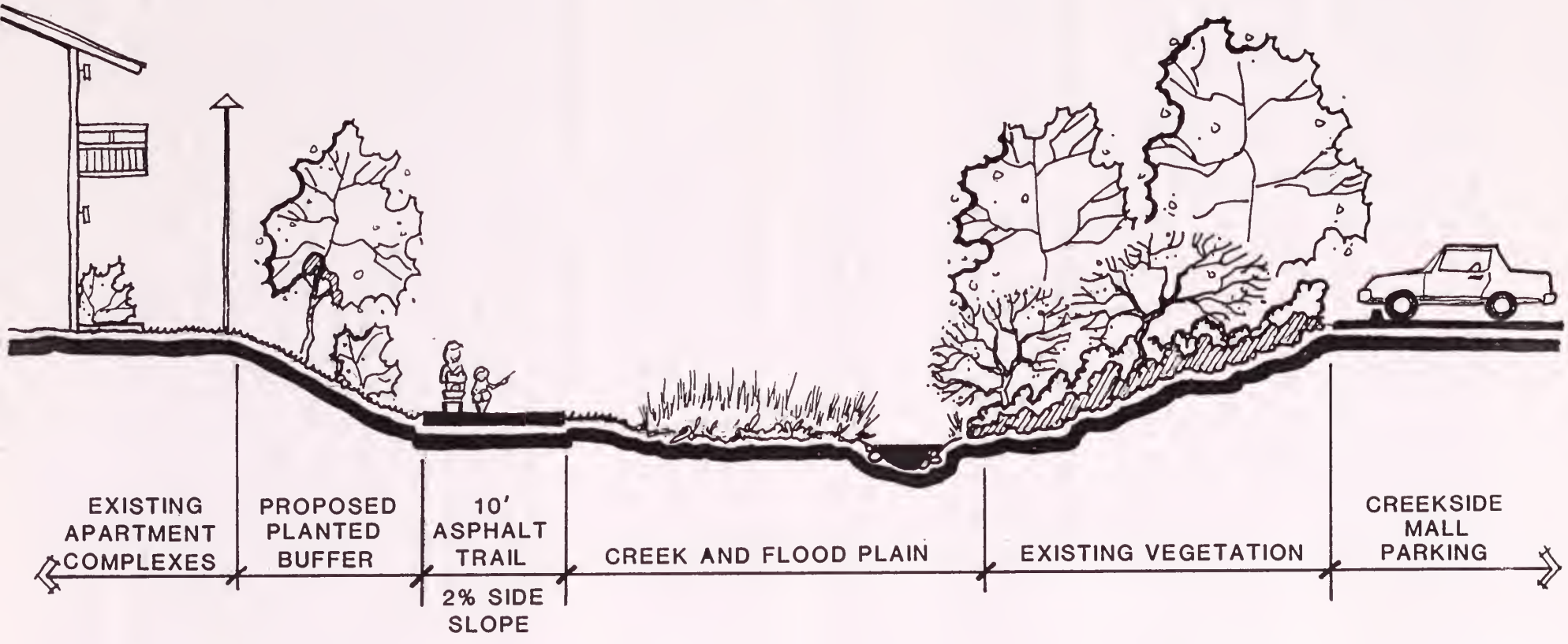


FIGURE 12

MULTI-USE TRAIL BETWEEN CREEKSIDE MALL AND APARTMENT COMPLEXES

SCALE: 3/32" = 1'-0"

The Team expresses a great amount of concern over the long term fate of the Gopher Tortoise that is known to nest in landscapes south of Creekside Mall and southeast of Green Acres Park. Therefore, the City's greenway facility development objectives will adhere to the advice provided by the Florida Game and Fresh Water Fish Commission, Wild Things, and A. F. Clewell regarding protection of these nesting sites and education of the public.

CREEKSIDE MALL TO GREEN ACRES PARK

From Creekside Mall south, the trail remains a multi-use, 10-foot wide asphalt trail, and will meander through an open space landscape to the existing Green Acres Park. Currently, this park is naturalized and has limited access. There are no public parking facilities provided at this City facility. The trail will be routed through the park in a manner that is most appropriate, given the existing activities, and continue south to Sugarfoot Prairie.

GREEN ACRES PARK TO SUGARFOOT PRAIRIE

From Green Acres Park, the trail tread will most likely change from an on-grade multi-use asphalt surface to a multi-use boardwalk trail. This determination will have to be made in the field, and will be based on the presence of wetlands and sensitivity of the local environment to greenway trail development activities.

Two separate trail routes will be created at this point: one that heads south to Forest Park, and the second which will head west to the Oaks Mall. These are more thoroughly described in the following sections.

Because Sugarfoot Prairie is so isolated and unique within the context of an urban landscape, this boardwalk, while providing controlled access to most of this area, will provide frequent pull over areas for observation of the surrounding landscape, coupled with a series of wayside exhibits. Furthermore, this section of the greenway will provide a special self-education opportunity for environmentally curious greenway users.

GREEN ACRES PARK TO OAKS MALL

From Green Acres Park, and heading west to the Oaks Mall, the multi-use trail will turn from on-surface asphalt to boardwalk and then back to on-surface asphalt. It may be possible to bench the trail into existing berms which were built to protect adjacent residential neighborhoods from flooding. Locating the trail facilities on the south and west sides of the berms utilizes the berm as a privacy and noise buffer for the adjacent neighborhoods (See Figure13). However, an evaluation of proposed boardwalk locations in relation to adjacent neighborhoods should be developed prior to their final location. Charette participants recommended that a long boardwalk with observation platform be extended into the prairie landscape so that users might have an opportunity to view the interior landscape. Before this is accomplished, the City will conduct a thorough environmental evaluation of the impacts such a boardwalk would have on interior species wildlife. In addition, the survival of Clear Lake depends upon the free-flow of water between the Sugarfoot Prairie and the Lake. This flow currently and historically has taken place through the culvert

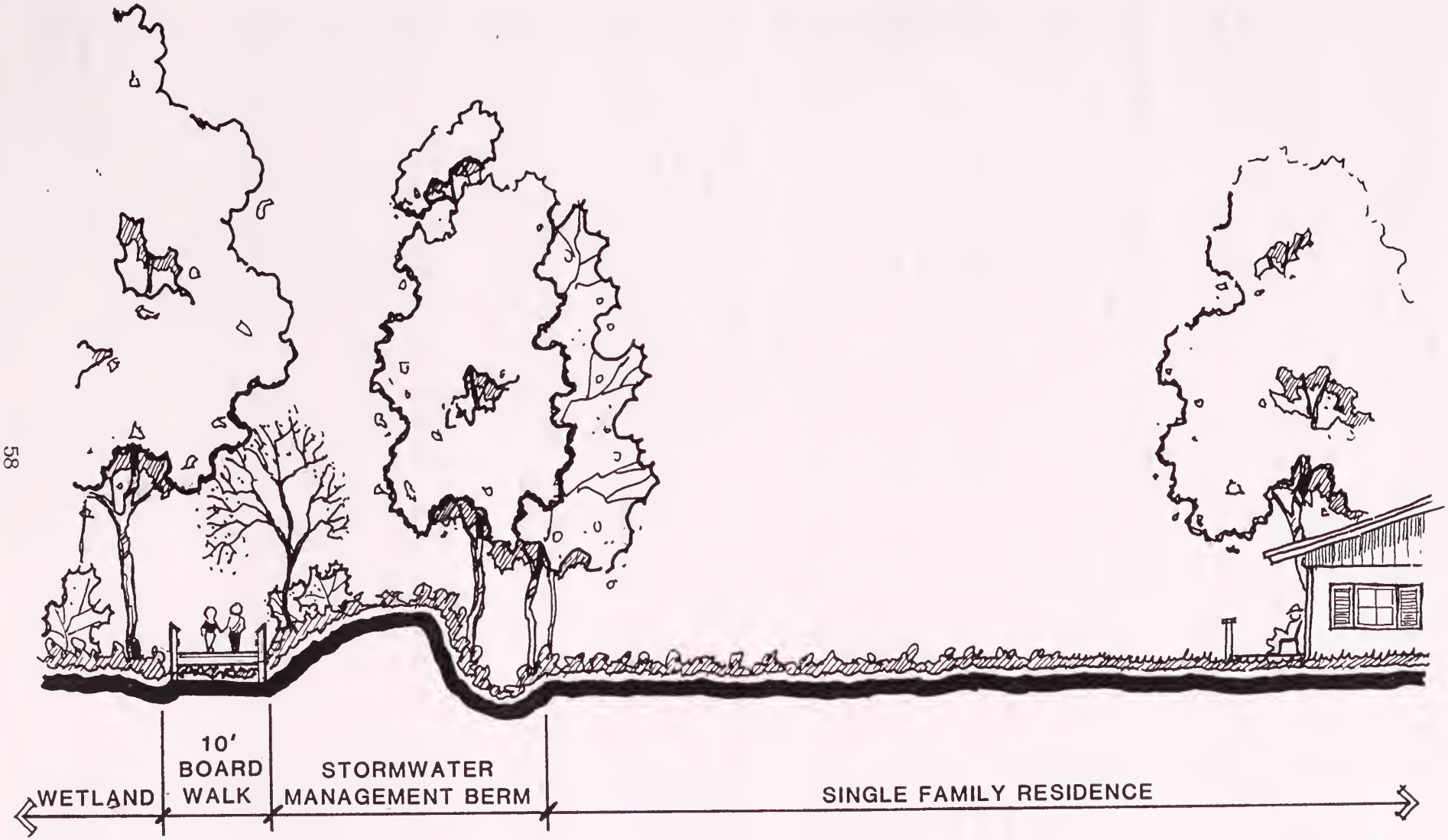


FIGURE 13

UTILIZATION OF SUGARFOOT PRAIRIE STORMWATER MANAGEMENT BERM

SCALE: 1/16"=1'-0"

and pump housing under Clear Lake Drive. Therefore, the appropriate trail facilities will be planned and utilized so as not to adversely affect this water flow and the survival of Clear Lake.

North and west of the prairie, the trail system will be linked to existing gravel and unimproved roads, in order to parallel the western edge of the prairie. Eventually, these roads connect to SW 62nd Boulevard, where a small trail head will be built. From this location, a short walk or bike ride will link the greenway user to the Oaks Mall or the unique community resource of Terwilliger Park, across SW 62nd Boulevard from the proposed trail head.

SUGARFOOT PRAIRIE TO FOREST PARK

From Green Acres Park heading south, along the southeastern edge of the prairie, the greenway trail will be primarily a multi-use boardwalk through the wetland areas, and an on-surface multi-use asphalt trail on higher land. At SW 20th Avenue, the Alachua County Department of Public Works would not support an at-grade crossing within the guardrails at the SW 20th Avenue bridge. Due to the heavy volume of traffic that exists on SW 20th Avenue, there would be very few gaps provided for crossing the road. Therefore, an on-grade crossing anywhere other than signalized intersections could not be justified. The Department of Public Works will require the trail to extend east, parallel to SW 20th Avenue, to the SW 43rd Street signalized intersection. After crossing the intersection, the trail will enter Forest Park and continue through to a mid-point of the park's west property line where the trail will cross Hogtown Creek by bridge into the Project Site.

Another alternative to be considered, in addition to the at-grade crossing at signalized intersections, is an overpass. The expense of such a facility may be justified due to the danger and potential liability of trail users attempting on-grade crossings at unauthorized points along SW 20th Avenue. Because of the bridge's low clearance and the creek's consistently high water levels, it was determined that an underpass at the bridge would not be feasible.

Presently, Forest Park does not provide public parking. However with future park development, the park could potentially serve as a trail head and provide vehicular parking for trail users.

Trail users to the west of the Project Site, along SW 20th Avenue or SW 62nd Boulevard, will use the at-grade crossing at the SW 62nd Street signalized intersection and the existing on-road bicycle facilities to access the Project Site. For the safety of the trail users, facilities will be provided to accommodate pedestrians and bicyclist along both sides of SW 20th Avenue between the SW 62nd Boulevard and SW 43rd Street intersections (See Figure 14). These proposed facilities will include improvements to the existing bridge. A thorough study of these SW 20th Avenue facilities will have to be conducted by the City to determine the safest and most efficient route for the trail.

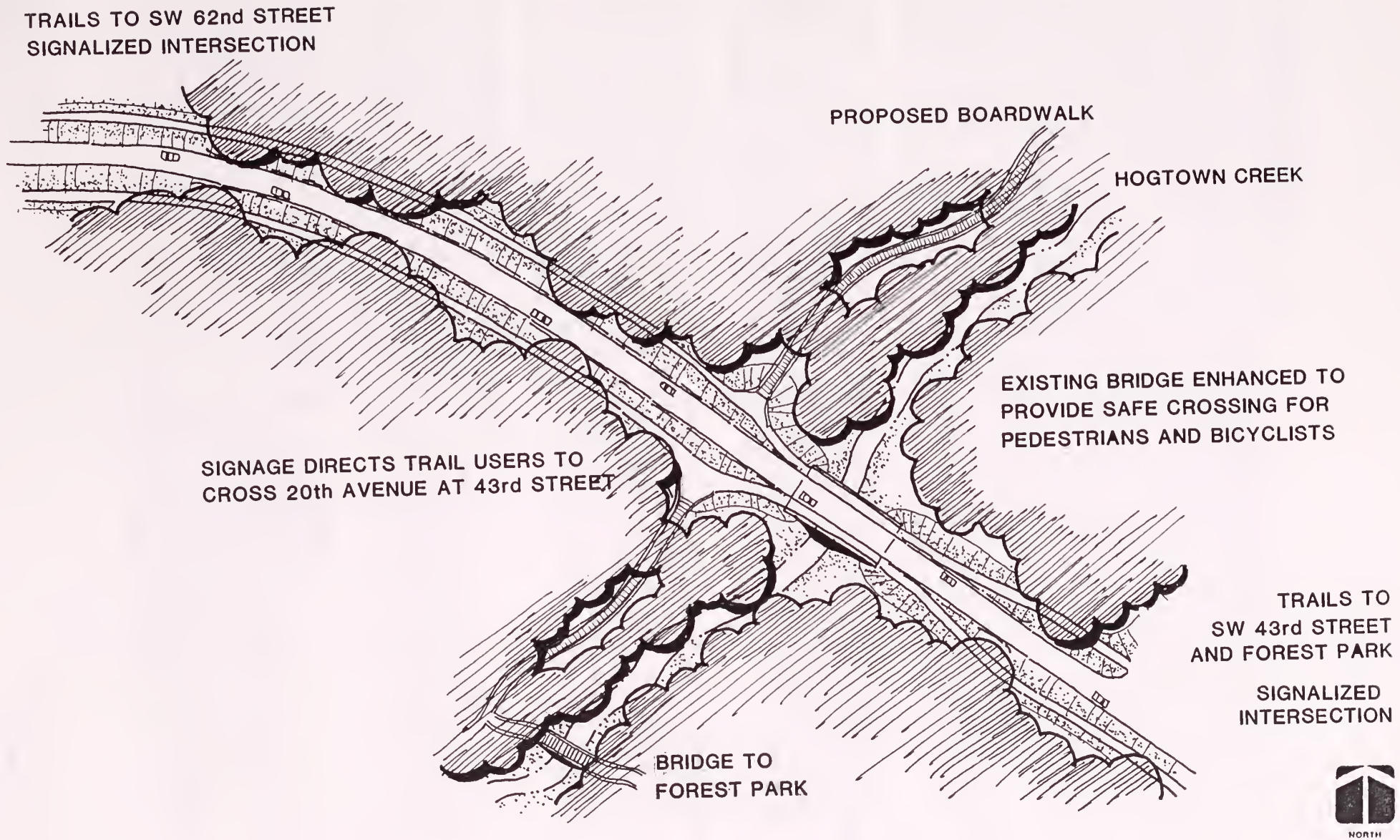


FIGURE 14

TRAILS AT THE SW 20TH AVE BRIDGE

SCALE: 1"=200'

SW 20TH AVENUE TO I-75

From SW 20th Avenue the multi-use off-road trail continues south where it intersects with Interstate 75. Despite the fact that additional widening is occurring along this stretch of the interstate highway, no provisions have been made to accommodate potential pedestrian access. Several options exist for crossing the interstate: 1) build an overpass across the highway; 2) terminate the trail north of the interstate bridges and provide a closed loop trail that will direct trail users back toward SW 20th Avenue, where parallel facilities will then direct users over the existing interstate roadway bridge; 3) build a multi-user trail parallel along the east side of the interstate within the powerline right-of-way, coordinate the trail with the planned roadway extension of SW 62nd Boulevard to SW 40th Boulevard (identified in the Metropolitan Transportation Planning Organization's 2015 Needs Plan), and make use of the existing SW 20th Avenue roadway bridge that crosses the interstate highway. All of these options will be further explored to determine appropriate costs, efficiency of connections and desire of greenway users (See Figure 15).

Currently, the SW 20th Avenue (Humpback Road) interstate bridge is too narrow to permit safe, shared crossing of the interstate. If the preferred option is to use this bridge, it will be necessary either to upgrade the structure or build a parallel facility for bicycle and pedestrian use. The Alachua County Public Works Department supports widening of this overpass to accommodate pedestrian and bicycle traffic.

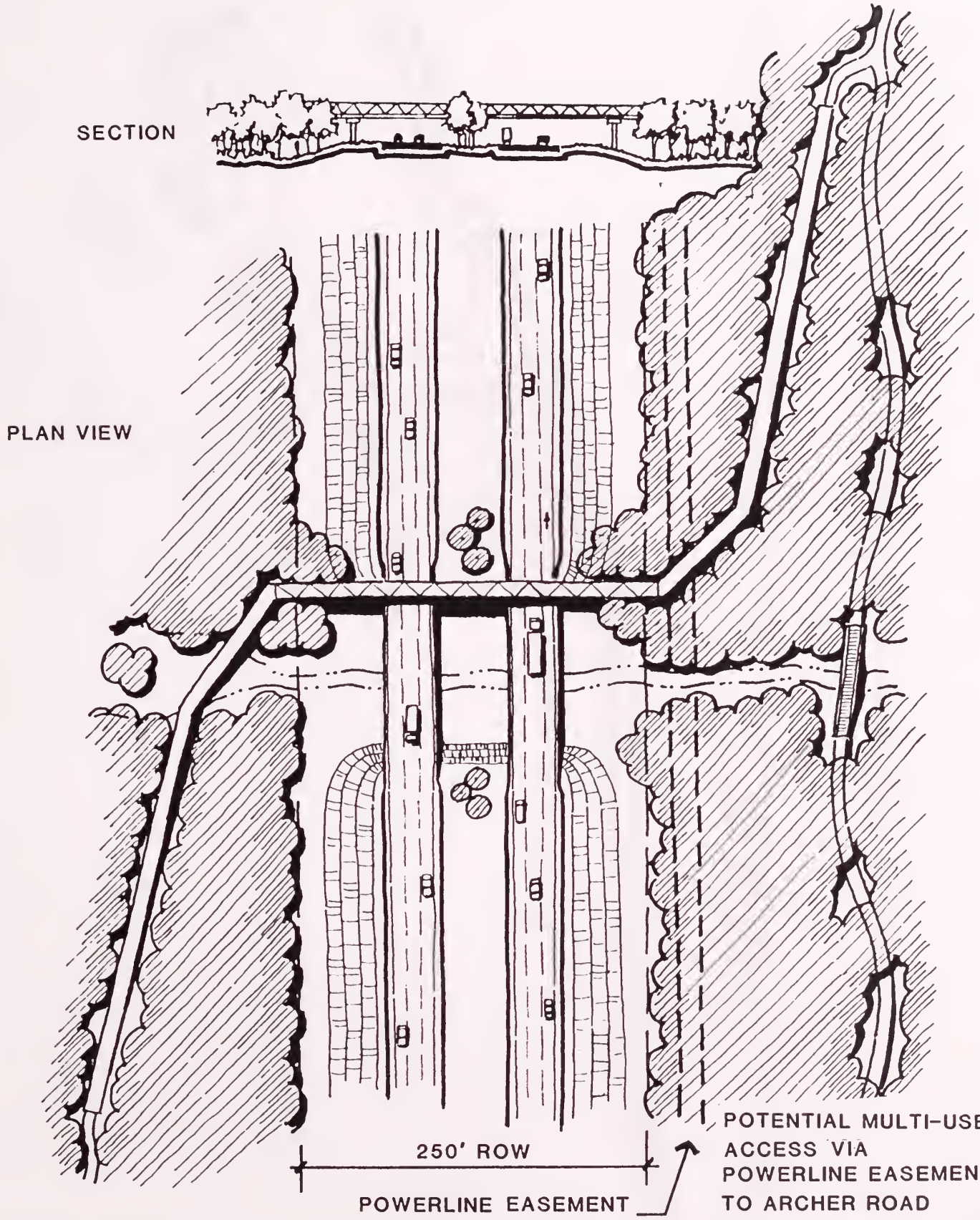
A tract of land that borders this area north of the designated greenway parcels (used as a borrow pit and fill site during the construction of I-75) currently supports a series of dirt bike trails. The City is currently considering to open discussions with this landowner and local dirt bike clubs to designate this piece of land for this use, and design sufficient dirt bike courses so that this use will occur at this location and not in the more environmentally sensitive areas throughout the greenway corridor.

SW 20TH AVENUE TO OAKS MALL

From SW 20th Avenue, on-road bike facilities, in the form of a two-way bike route or bike lanes, should be added to the existing sidewalk facility along SW 62nd Avenue, to improve access between Forest Park and the Oaks Mall and Terwilliger School. The intersection of SW 20th Avenue and SW 62nd Avenue is currently controlled by a traffic signal.

I-75 TO KANAPAHA BOTANICAL GARDENS

Depending on how I-75 is crossed, the off-road trail is envisioned as continuing south, along the southeast side of Lake Kanapaha and Hogtown Prairie, to the Kanapaha Botanical Gardens. This is a vast, environmentally sensitive, unique and spectacular landscape. Greenway facility development through this landscape will need to be carefully routed to avoid impacting this ecosystem (See Figure 16). Strategically placed loop trails will be designed to offer the user an opportunity to get closer to certain landscape features.



INTERSTATE 75 OVERPASS AT HOGTOWN CREEK

SCALE: 1" = 100'-0"

FIGURE 15

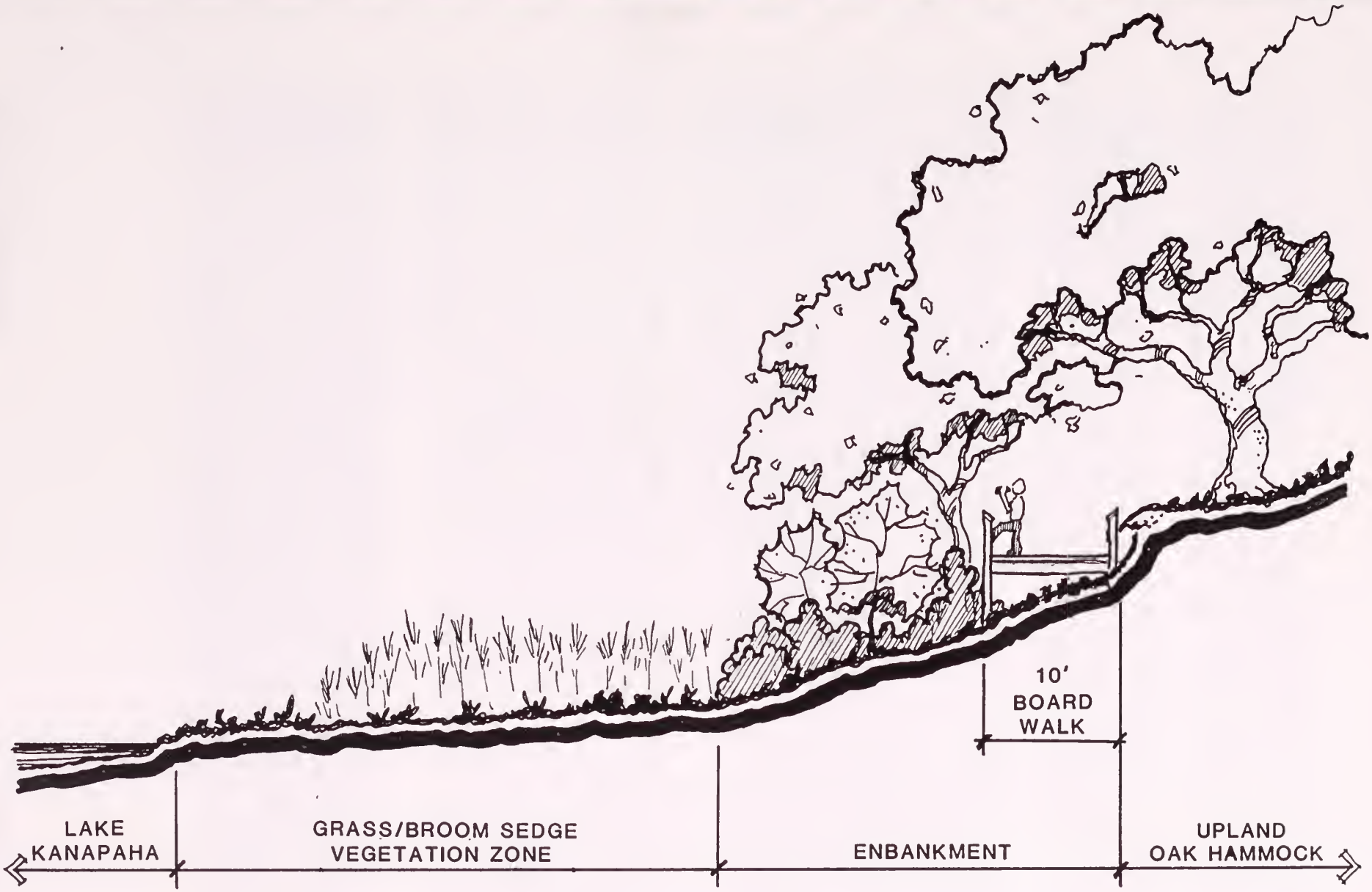


FIGURE 16 TYPICAL BOARDWALK FACILITY AT LAKE KANAPAHA

SCALE: 3/32" = 1'-0"

Because of the possible limited use of horse trails within this area of the greenway parallel trail treads are proposed for bikers, hikers and horseback riders that are kept within a well defined corridor of travel. These separated treads should alleviate multi-user conflicts, and allow different user groups to experience the landscape at a measurable pace, without increasing erosion.

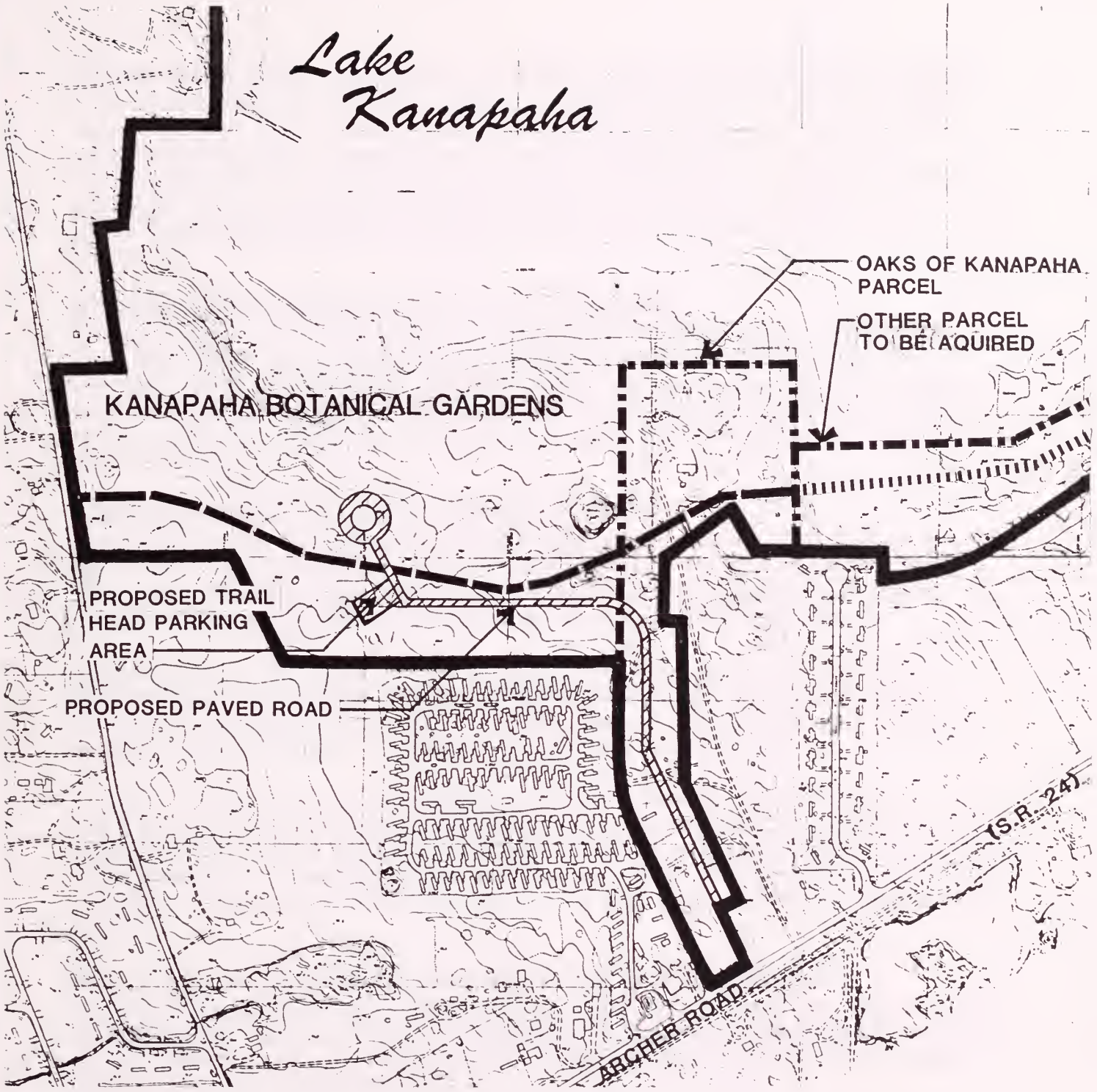
This area of the project offers a tremendous opportunity for eco-tourism activity through coordinated wayside exhibits, group-led interpretive programs, and other special events designed to extoll the virtues of this landscape. The Kanapaha Botanical Gardens should be an integral component of this eco-tourism effort, as it is already a regionally significant attraction.

The Botanical Gardens currently provide some public parking to accommodate greenway users. However, additional parking facilities will be provided to serve user needs when the gardens are closed (See Figure 17). It is anticipated by the County Department of Public Works, the Botanical Gardens and the Team that a new entrance road and parking facility, that is accessed via Archer Road, will be located to complement the garden's existing access and parking area. In addition, it will serve as the southern terminus of the greenway while minimizing environmental and aesthetic impacts. The proposed access from Archer Road to the Botanical Gardens will also provide an excellent linkage opportunity with the Archer to Gainesville Rails Trail project, which has been proposed to utilize the existing power line easements and an abandoned railway corridor along SW Archer Road.

GREENWAY IMPROVEMENTS WEST OF KANAPAHA BOT. GARD.

Proposed greenway improvements west of the Kanapaha Botanical Gardens will provide enhancements to the greenway system as well as linkages with SW 75th Street and SW 24th Avenue. These proposed improvements consist of: 1) a linkage through the Botanical Gardens from the southern terminus of the greenway to SW 63rd Boulevard; 2) a linkage from SW 63rd Boulevard at its entrance to the Botanical Gardens north along Stagecoach Road to SW 24th Avenue; 3) trails into the Lake Kanapaha area from SW 63rd Boulevard, or Stagecoach Road to SW 75th Street and Kanapaha Park via utility easements and/or SW 41st Place.

While not part of the original Project Site as approved by the Florida Communities Trust, these improvements will provide desirable linkages and enhancements to the overall project once the primary improvements are installed on the Project Site from the east side of Lake Kanapaha to the Botanical Gardens, as shown in this Master Plan report. Following or concurrent with the construction of these improvements, the County will work with the City to provide optimal linkages to SW 75th Street and SW 24th Avenue utilizing the recommended or other alternate routes.



TRAIL HEAD FACILITIES AT KANAPAHA BOTANICAL GARDENS

Hogtown Creek Greenway

GAINESVILLE, FLORIDA

LEGEND

MULTI-USE TRAIL

MULTI-USE BOARDWALK

FIGURE 17

KANAPAHA BOT. GARDENS & WEST SIDE OF LAKE KANAPAHA

This area, Kanapaha Botanical Gardens and the west side of Lake Kanapaha, was discussed by the Team as being possible good locations for incorporating an observation tower amongst the live oaks, enabling visitors to view the ecosystem of the lake without disturbing the wildlife (See Figure 18). However, the location of an observation tower will require additional analysis of the entire Lake Kanapaha area to determine the most qualified site for such a structure.

STAGECOACH ROAD TO SW 75TH STREET

Charette participants advocated a connection from Stagecoach Road to SW 75th Street and Lake Kanapaha Park via SW 41st Place. This is likely an overland connection through available utility easements and publicly owned park lands. Kanapaha Park could also serve as a trail head for the southern terminus of the Project Site, and once completed will offer ample parking for greenway users.

ALONG TOWER ROAD TO ARCHER ROAD

The neighboring subdivisions of Haile Plantation, Kenwood, Valwood, Green Leaf, etc., offer an excellent source of greenway users for the Hogtown Creek Greenway. Therefore, the Team recommends a formal connection be made along SW 41st Place between SW 63rd Boulevard and SW 75th Street.

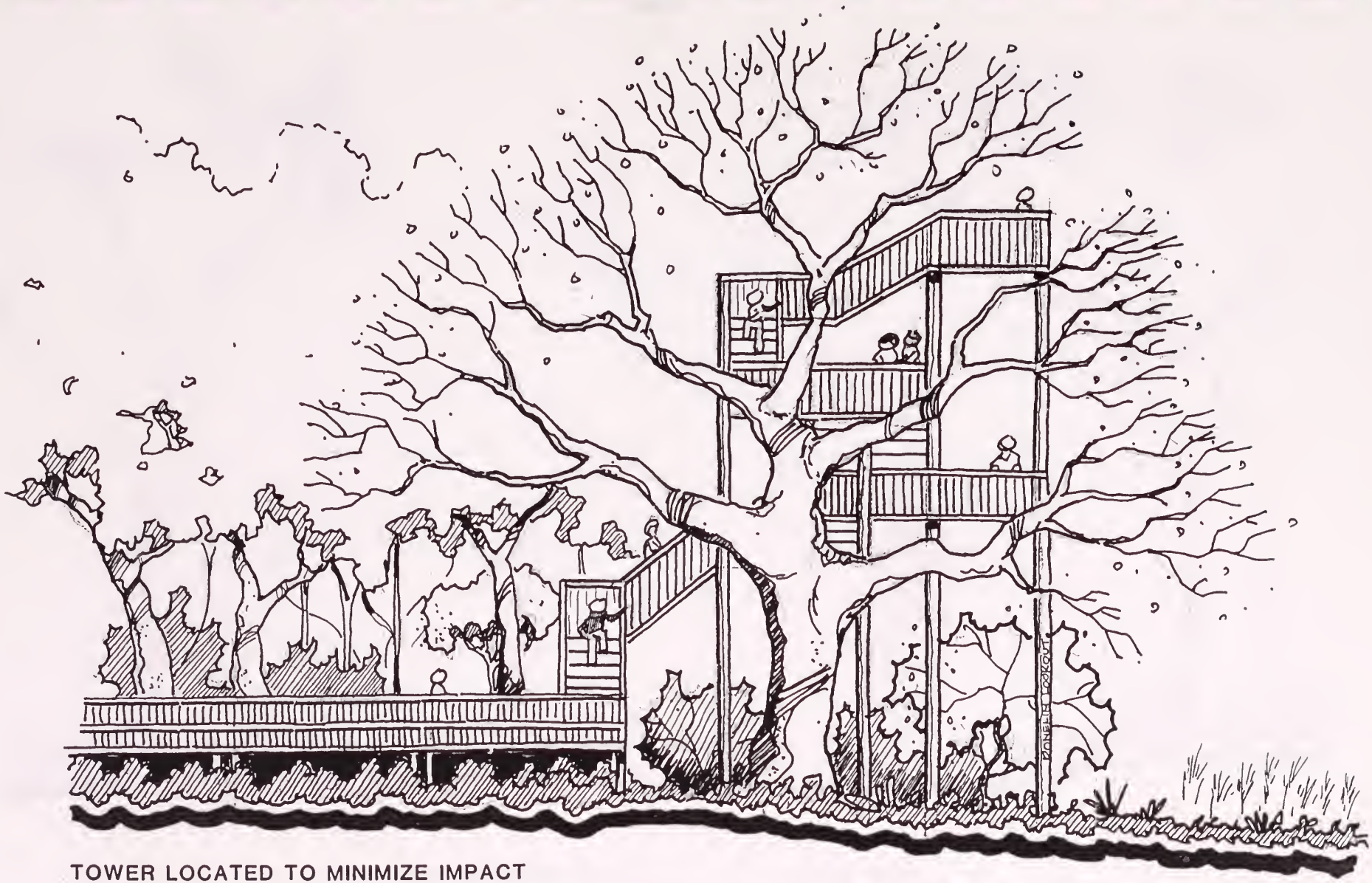
Sidewalks and bike lanes along SW 75th Street will also provide linkage to Kimball Wiles School and the proposed Middle School. An existing trails system already exists behind the elementary school which may provide some linkage opportunities with Kanapaha Park and the Project Site.

Finally, the concept of Park and Bike, or Bike and Ride was thoroughly discussed during the charette. The City is considering providing facilities that allow cyclists to store their bikes in lockers at certain transit stops, or provide an opportunity to load their bikes onto busses. This will increase the efficiency of transportation within the community and offer local residents a choice in travel.

SW 75TH STREET TO I-75 ALONG SW 24TH AVENUE

In completing the final loop of the greenway system, consideration will be given to adding sidewalks and bike lanes along SW 24th Avenue (Humpback Road) so that greenway users can effectively loop back north to Forest Park and other destinations in the community.

Charette participants also discussed a possible connection off of SW 24th Avenue to Hogtown Prairie and Haile Sink. This is the only area of the greenway that was considered by charette participants for possible equestrian trails (See Figure 19). The Team recommends that if this is desired, it could be best accomplished though a program group-led tour that will be sponsored by the City or another agency.



TOWER LOCATED TO MINIMIZE IMPACT
ON VEGETATIVE AND WILDLIFE COMMUNITIES

OBSERVATION PLATFORM AT LAKE KANAPAHA

FIGURE 18

SCALE: 3/32" = 1'-0"

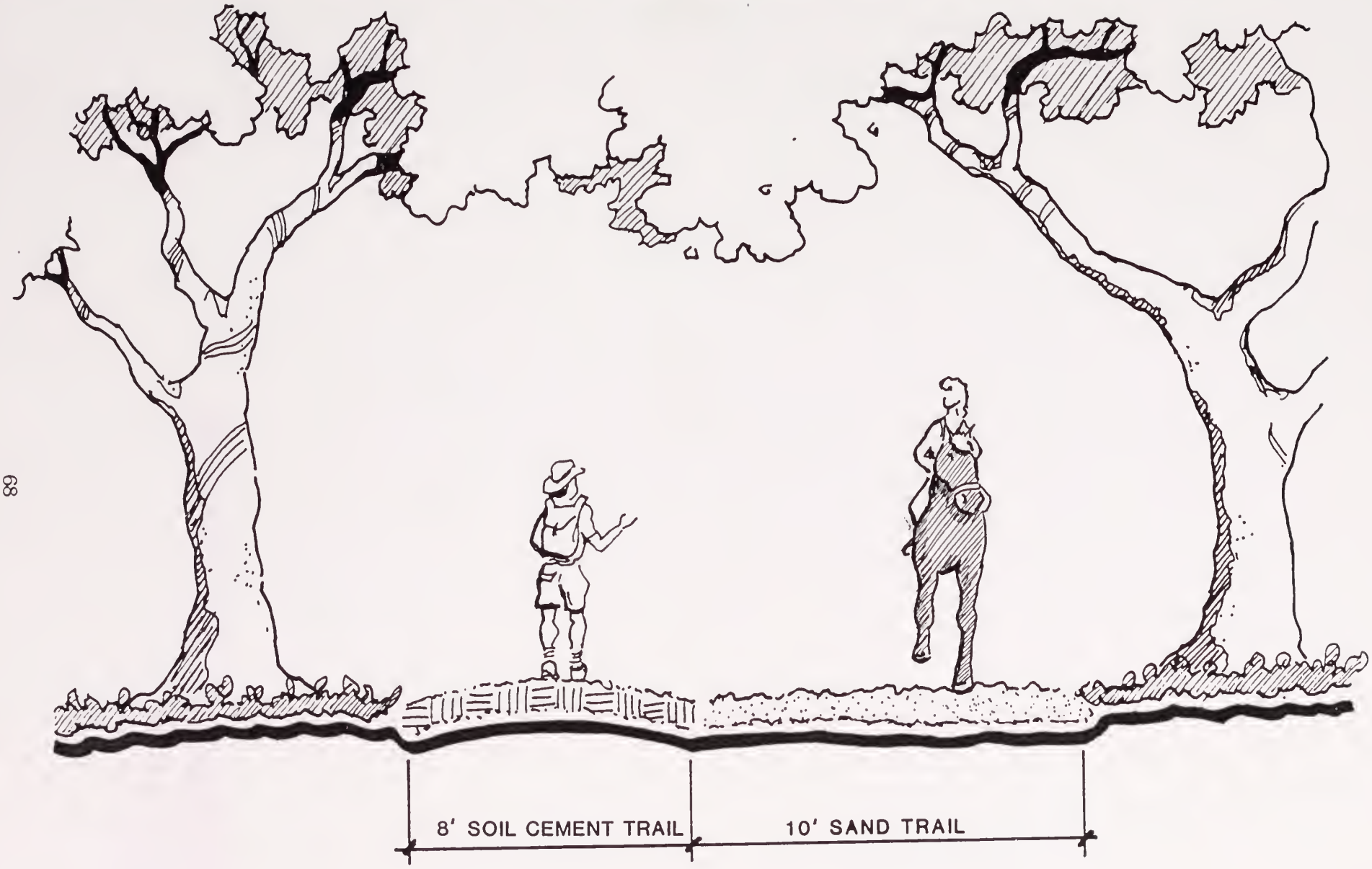


FIGURE 19

TYPICAL PARALLEL EQUESTRIAN AND PEDESTRIAN TRAILS

SCALE: 1/4" = 1'-0"

OTHER RECOMMENDED FACILITIES

OTHER RECOMMENDED FACILITIES

Throughout the development of the Hogtown Creek Greenway, a number of other facilities, in addition to trails, will be developed to maximize safe and compatible use of the environment and to enhance the interrelationships between the public greenway corridor and adjacent private properties.

GREENWAY SIGNAGE

The City of Gainesville will need to install a comprehensive system of signage throughout the proposed greenway. This will include the following types of signs:

Informational: orients users to their position within the trail system (i.e. "You are here") provides an overview of the types of facilities within the greenway that are open to the public, programs and activities available, and describes routes or mode of travel required to reach these facilities. Also, these signs will include approximate distances and time of travel anticipated to reach certain destinations. Because these signs will be located at all major entrances to the greenway, they will also be used to recognize those parcels that were purchased with funds from the Florida Communities Trust, the City of Gainesville and, or, Alachua County.

Directional: provides users with instructions regarding their bearing and route of travel. Most directional signage is in the form of graphic symbols (pictographs) and brief descriptions or listings. For example, directional signage will include arrows that indicate a heading (direction of travel), and descriptive text such as "this way," "keep to the right," or "south, one-mile."

Regulatory: describes the governing laws and regulations that apply within the trail, such as permitted uses, hours of operation/accessibility, speed limit, allowable activities, and legal requirements for use. Regulatory signs must be uniform and standard in terms of size, location and information. All regulatory signs should have black lettering on white reflective background. Regulatory information should not conflict in any way with other components of the signage program, or vice-versa.

Warning: used to caution trail users of various hazardous conditions, such as sharp curves in the trail, slippery bridges, roadway crossings, steep downhill or uphill conditions, blind intersections, changes in trail surface condition, and other related warnings about environmental conditions of the greenway. All warning signage will be signs of uniform size and shape, located a minimum of 50 feet in advance of the condition that the trail user is approaching, and labeled with black lettering on a reflective yellow background.

Educational: also termed interpretive signage, it is used to describe the unique qualities or significance of natural or cultural features along the greenway. Educational signage provides the user with specific information about the features, such as age, habitat, historical relevance or specific relation to humankind.

Festival: specialized type of trail signage that is used to commemorate special events and holidays, or to add accent, color and decoration. Festival signage usually offers limited information about a specific event. This type comes in many different forms, from cloth banners, to flags, to specially created pole-mounted hard surface signs.

Because much of the Hogtown Creek Greenway will be designed and built to support bicycle usage, and due to the fact the City anticipates using transportation funds to build portions of the project, the City will be using AASHTO standards, and the Manual on Uniform Traffic Control Devices (MUTCD) as the specifications for signage throughout the project. These standards can be supplemented with a specially created signage system for the greenway, as illustrated in Figure 1.

Greenway Logo: A greenway logo will be created for the Hogtown Creek Greenway. This could by achieved by the City sponsoring a community-wide competition to develop an appropriate logo for the greenway. This has been successfully accomplished in cities like Raleigh, High Point and Charlotte, North Carolina, and most recently in Knoxville, Tennessee. A logo design competition offers an opportunity to have local citizens involved in establishing the greenway, and will further serve to publicize the project to those citizens who have not yet heard of the project. The Team will agree to assist the City with the execution of the competition.

LIGHTING OF GREENWAY FACILITIES

As a general rule, and in compliance with the Hours of Operation for the greenway, as described in the Greenway Safety and Security section of this report, the greenway will not be lighted with the exception of a few select locations. Portions of the greenway that would be appropriate for pedestrian scale lighting include:

Westgate Shopping Center - due to the nighttime activities in this area, additional pedestrian scale lighting will be needed for the proposed trail from NW 34th Street to Creekside Mall. This will include lighting the underpasses or bridges in this area of the project.

Creekside Mall to University of Florida - again, after dark, if 24-hour usage is anticipated along this segment of the greenway, pedestrian scale lighting will be needed. This greenway segment also links several apartment complexes that will benefit from having lighted access to the University, and Creekside Mall.

The lighting of greenway trails and facilities, comes additional responsibilities for maintenance, police/park officer patrol and emergency response. Lighted areas will also be equipped with emergency (911) phone systems, to promote safety and enable better response by law enforcement personnel. Specific types of lighting fixtures, and the location of these fixtures throughout the greenway is a site plan issue, and will be determined by the City at a later date.

BATHROOM & POTABLE WATER FACILITIES

Public restrooms and water fountains will be provided at key points throughout the greenway system. These should be cited in conjunction with existing park sites, and other public facilities capable of supporting greenway users. Generally, these facilities are normally provided within typical greenways on an "as-needed" basis. The following locations will be specifically defined within maps and brochures for the greenway, and on signage systems throughout the greenway, designating where restrooms and drinking fountains are available. Some of these sites will require the installation of new restrooms and drinking fountains.

- Gainesville Mall
- Ring Park/Elks Lodge
- Westside Park
- Loblolly Environmental Education Facility
- Green Acres Park
- Forest Park
- Oaks Mall
- Kanapaha Botanical Gardens

PICNIC, SCENIC VIEW SHED AND REST AREAS

The Preferred Design Concept Plan map denotes areas throughout the greenway that offer ideal areas for picnicking, scenic views and appropriate rest stops. The type and amount of facilities at each of these locations is best left to decisions that will be made during the preparation of site plans. As a general rule, these areas should be designed to be low maintenance, accessible to maintenance vehicles, and appropriately signed with User Rules and Regulations. For large group activities and popular destinations, the City and County may want to consider implementing a reservation system to manage use. The ideal sites for locating picnic facilities are as follows:

- Ring Park
- Westside Park
- Green Acres Park
- Forest Park
- Kanapaha Botanical Gardens

Scenic areas throughout the greenway should be emphasized by overlook platforms, boardwalks that extend into native landscapes or observation towers, where appropriate. Again, these facilities are best determined through a more detailed site design for each scenic overlook. The areas within the Project Site that have scenic view sheds that may be considered for locating observation facilities are as follows:

- Loblolly Environmental Education Area
- Sugarfoot Prairie
- Hogtown Prairie
- Lake Kanapaha

Rest areas are located frequently throughout the project area. For example, rest areas can be the park sites, public schools, shopping malls, and destinations within the University of Florida. Additionally, some greenway users will most likely travel to neighbors homes, offices, or other commercial establishments along the greenway.

USE OF RECYCLED WASTE MATERIALS

The Town of Cary, North Carolina and Greenways Incorporated pioneered the use of recycled waste products in developing the Swift Creek Recycled Greenway. In doing so, the level of awareness has been raised, nationally, regarding the use of recycled plastic lumber for building greenway bridges, sign posts, benches and boardwalks; bottom ash from coal fire electrical generation plants as a substitution for aggregate base course; recycled aluminum for information, educational, festival and directional signage; and recycled asphalt for paved multi-use trails. As the City considers design development strategies for specific facilities, recycled waste materials and products will be strongly considered for use in construction. The Regional Transit System is currently exploring the use of recycled materials in the improvement of bus shelters and other amenities. The Team recommends that as the City considers design development strategies for specific facilities, recycled waste materials and products be strongly considered for use in construction. Some recycled waste products have been demonstrated in Cary, NC to have saved the town money, in comparison with traditional raw materials. Specific applications depend on regional considerations, most importantly the cooperation of local industries, product manufacturers and sales representatives in the development and delivery of these products at a cost effective price.

IMPACTS OF GREENWAY DEVELOPMENT

IMPACTS OF GREENWAY DEVELOPMENT

Greenway facility development is not without impacts, both to the natural environment and to adjacent land uses. However, through proper planning and appropriate design, most of these impacts can be mitigated, and a successful public-use facility can be developed. Therefore, before undertaking any site alterations or physical improvements that are not addressed in the approved Master Development and Management Plan, the City shall request written approval for the proposed modifications from the Florida Communities Trust.

The Consulting Team and the City will develop this greenway facility in a manner that exemplifies the best in environmental sensitivity and land development, and strives to minimize negative public impacts on adjacent private properties. Based on our analysis of the Hogtown Creek greenway corridor, we feel that the following areas will receive the most impact from greenway facility development.

ENVIRONMENTAL IMPACTS

Of primary concern to the City and the Consulting Team is the protection of sensitive landscapes, including steep slopes, habitat of rare or threatened plants and animals, wetlands, the natural creek channel and tributaries of Hogtown Creek and certain portions of the floodplain which are easily scarred by public access and use.

The project will be consistent with Federal, State, Water Management District and Local Regulations to protect wetland sites from facility development encroachment. It is the goal of the City's and the Team's design to avoid, or minimize disturbance to all jurisdictional wetland areas of the project.

PROJECTIONS OF USE/LANDSCAPE CARRYING CAPACITY

One of the greatest impacts to the ecological systems of the study corridor landscape will come from the permitted public access and use by trail enthusiasts, commuters and recreationists. Given the current status of disorganized and unstructured recreational use, the Consulting Team believes that the study corridor landscape is suffering its greatest use-related impact. A clearly defined network of trail treads, along with a structured public access and use management program will offer delineated corridors for these activities, and thus reduce wide spread impacts.

In order to better understand the limits of carrying capacity, the level of use must first be defined throughout the corridor. The Consulting Team predicts that usage levels will vary throughout the corridor, based largely on origin/destination and usage generators, and on user profiles that have been generated from other greenway systems throughout the United States.

Between NW 23rd Boulevard and NW 16th Avenue, the Team projects that the usage will be of medium intensity (See Table 3); however, the preferred route for the greenway, the size and types of greenway lands proposed for use, and the land's environmental sensitivity, offer greater carrying capacity in the landscape to absorb higher levels of future use.

TABLE 3

Intensity of Trail Use

User Type	Low Intensity Use	Medium Intensity Use	High Intensity Use
Pedestrian/Walker	2 PFM [1] or Less	10-15 PFM	25 PFM
Bicyclists	50 ADBT [2] or Less	200 ADBT	1000 ADBT
Equestrians	4 HTD [3] or Less	20 HTD	100 HTD

1) PFM = pedestrians per foot width of walkway/minute: Source Timesaver Standards for Landscape Architecture
2) ADBT = average daily bicycle trip: Source: Greenways Incorporated
3) HTD = horses per 6 foot trail/day: Source: American Horse Council

Between NW 16th Avenue and Green Acre Park, the geographic center of the project, the Team believes that the level of usage will be high intensity. This intensity will vary depending on the type of facilities developed and the connections that are made with different land uses. For example, usage by 350 persons per day during the week might occur between NW 16th Avenue and Loblolly Environmental Education Center. On the weekend this could rise to 500 or even as high as 750 users on a sunny and mild day. Around Westgate Shopping Center and Creekside Mall, use is likely to extend into the evening, and therefore exceed these usage estimates. If a trail system is extended from these commercial areas to the University of Florida campus, it would not be unusual to see average usage at 1000 users/day.

Between NW 16th Avenue and Green Acre Park the environment has been modified by man, and, with the exception of the Loblolly Environmental Education Center, it is not considered to be highly sensitive landscape to further encroachment. The current conceptual plan for the greenway contains ideas for restoration of this landscape, to improve ecological function, aesthetics and biological diversity.

From Green Acre Park to I-75, and Sugarfoot Prairie, the ecological sensitivity of the landscape gains greater value, and the concern over public access and use is of greater importance. Due to the origins and destinations in this area, and the distances between other community resources, we estimate that usage will be of low intensity. Event programming may boost infrequent medium intensity use, but for the most part the Team estimates that during the weekdays, usage will remain around 75 persons per day through this area, rising to 250 users per day on weekends. The area around Forest Park may receive higher levels of usage, especially on weekends. The Team feels that these landscapes are sensitive to human use, and carrying capacity is limited through this area. Much of the use in this area is proposed to be restricted to upland areas, or confined within boardwalk trails.

The Lake Kanapaha and Hogtown Prairie landscape is highly sensitive for many reasons, and therefore has a very limited carrying capacity. Public access and use will need to be both programmed and actively monitored to prevent degradation of the environment. At the same time, this landscape is the largest throughout the entire greenway system, and therefore is capable of supporting high usage levels, as long as this usage is not too concentrated nor occurs too frequently in one area. Dispersing the usage to different areas of this landscape will be the key to matching environmental carrying capacity. The Team feels that usage throughout this landscape will be low to medium intensity, based on 1) the origin/destination points surrounding the area, 2) degree of control that will most likely be exercised by management agencies, and 3) the desire of people to travel to this area from other parts of the community. Events programming will raise this level of use. Usage could exceed medium intensity if, for example, successful ecotourism programs are established.

Finally, another way to examine the issue of carrying capacity is to define the type of usage that is likely to occur within the greenway and attempt to measure its impact on certain types of environments. Table 4 is an example tool that may be used to provide a brief assessment of how certain usage is graded by its impact on the environment.

TABLE 4

Environmental Suitability of Trail Use within Sensitive Environments

	Type of Use					
Ecological Sensitivity	No Access	Walking	Bicycling	Equestrian	Mountain Bike	Motor Bikes
Low (upland terrace, stable-rocky soils and mature forest)	O	O	O	O	O	O
Moderate (lowland terrace, river valley, suitable soils, successional forest)	O	O	O	O	O	O
High (wetlands, pocosins, steep slopes, hydric soils)	O	O	O	O	O	O

O most suitable O suitable O not suitable

Source: Greenways Incorporated 1990

INFLUENCES OF PROPER TRAIL TREAD DEVELOPMENT

Based on the Preferred Design Concept generated by charette participants, the following trail tread types will be utilized for the Hogtown Creek Greenway:

- 10-foot wide, asphalt paved, multi-use trail
- 8-foot wide, soil cement, pedestrian only trail
- variable width, concrete sidewalks
- variable width, wood or recycled plastic lumber boardwalks

The greatest impacts to the environment occur when these trail treads are built. Construction practices will be specified during the design development phase which will limit the amount of encroachment into the native environment for construction of these trails and other greenway facilities. This will include limiting the type of equipment that is used to small machinery so as to reduce operating space requirements; phase trail development so that environmentally suitable points of ingress and egress are determined that permit sensitive construction practices; or define a longer time frame for construction and encourage the use of hand-construction practices to reduce the need for large, more efficient equipment.

The trail tread types and surfaces that have been selected for the greenway are designed to be both low maintenance and durable for intensive use, while not destroying the natural surrounding ecosystems. The multi-use asphalt trail will be built using geotextile fabrics to maintain the integrity of the subbase and extend the life of the surface. The soil cement trail offers several advantages during construction, most importantly that it can be built in short sections, and makes use of the existing soil mass. Properly developed soil cement trails are capable of supporting intensive pedestrian use, and withstand the natural influences of water and wind erosion. However, repeated mountain bike use could rut the surface and cause tread failure.

These trail tread types, if properly developed, should significantly reduce the excessive wear and resulting sediment that is generated from natural surface trails.

IMPACTS ON ADJACENT PROPERTIES

Local residents have shown that they are very concerned with existing patterns of public use within the Hogtown Creek corridor, and transfer their concerns to proposed future development of greenway facilities. Issues regarding safety and security of greenway facilities, the economic impact of greenway development on private property values, liability of adjacent private property owners with respect to the adjacent public greenway, perceived criminal activity associated with greenway development, and the responsibilities of local government for maintenance and management of the public resource are of primary concern to adjacent landowners. This report addresses these issues and suggests a specific management plan for the Hogtown Creek Greenway. After review of this report has been completed by appropriate agencies, the Consulting Team will respond to specific concerns not yet addressed, and make every effort to provide up-to-date information that can serve to satisfy unresolved issues.

BUFFERING AND SCREENING

The Consulting Team concluded from discussions held with City staff, local citizens and the Design Charette participants, that loss of privacy is one of the most important issues to address in the design and development of the Hogtown Creek Greenway. Loss of privacy can stem from direct visual connection from the public use greenway to private property; from physical access to properties because no delineation between public-private property is present in the landscape; and from noise that is generated from the greenway users. There are several ways in which privacy, buffering and screening can be enhanced through greenway trail and facility development. One option would be to make certain that final trail alignments are routed away from adjacent homes, or to install earthen berms between homes and trails or facilities. Grade separation is another way of achieving buffering, but is somewhat difficult to plan for in Gainesville due to the flat terrain.

The two best methods the City will use for resolving the potential loss of privacy due to greenway facility development is to: 1) install appropriate fencing between the greenway trail and private property; and 2) install appropriate evergreen and deciduous plants to serve as a vegetative buffer between the uses (See Figure 20).

Fencing - A 6-foot high wood privacy fencing will be installed at appropriate locations adjacent to residential property to mitigate both physical and visual access to private properties. This proposed fencing will be designed to be attractive and secure, so that it complements both land uses.

Vegetative Buffers - Native or non-invasive exotic, tall evergreen shrubs and trees be installed in appropriate locations along the trail to provide separation between the trail and adjacent private properties. The primary purpose of these planted areas will be to provide physical and visual separation between uses. The shrubs and trees will have to be appropriately selected for each location so that their growth habit is full, and so they achieve mature height within a reasonable time frame.

MITIGATING VISUAL BLIGHT

The greenway's development will also, account for adjacent land uses that are not desirable to view from trails and other facilities within the project. For the most part, the project study area does not possess extensive areas of visual blight. The few that the Team recognized from its on-site evaluation of the project study area includes: behind Gainesville Mall, Westgate Shopping Center and Creekside Mall. Some screening of these areas may be necessary to soften these degraded or utilitarian landscapes. Vegetative screening will be accomplished through the use of native or non-invasive ornamental species. Fences or decorative walls might be used if limited space is an issue. The Hogtown Creek Greenway is an urban experience, and its relationships with surrounding properties will not be eliminated to improve aesthetics. Part of the educational experience of the greenway is to witness the proximity of urban development adjacent to fragile and diminishing natural resources.

PERMITS REQUIRED FOR GREENWAY DEVELOPMENT

At this stage in the planning and design process, the Team has identified several agencies that will have to review design development plans before one shovel of dirt is turned for greenway facility development. An itemization of some government permits that will be required is shown below.

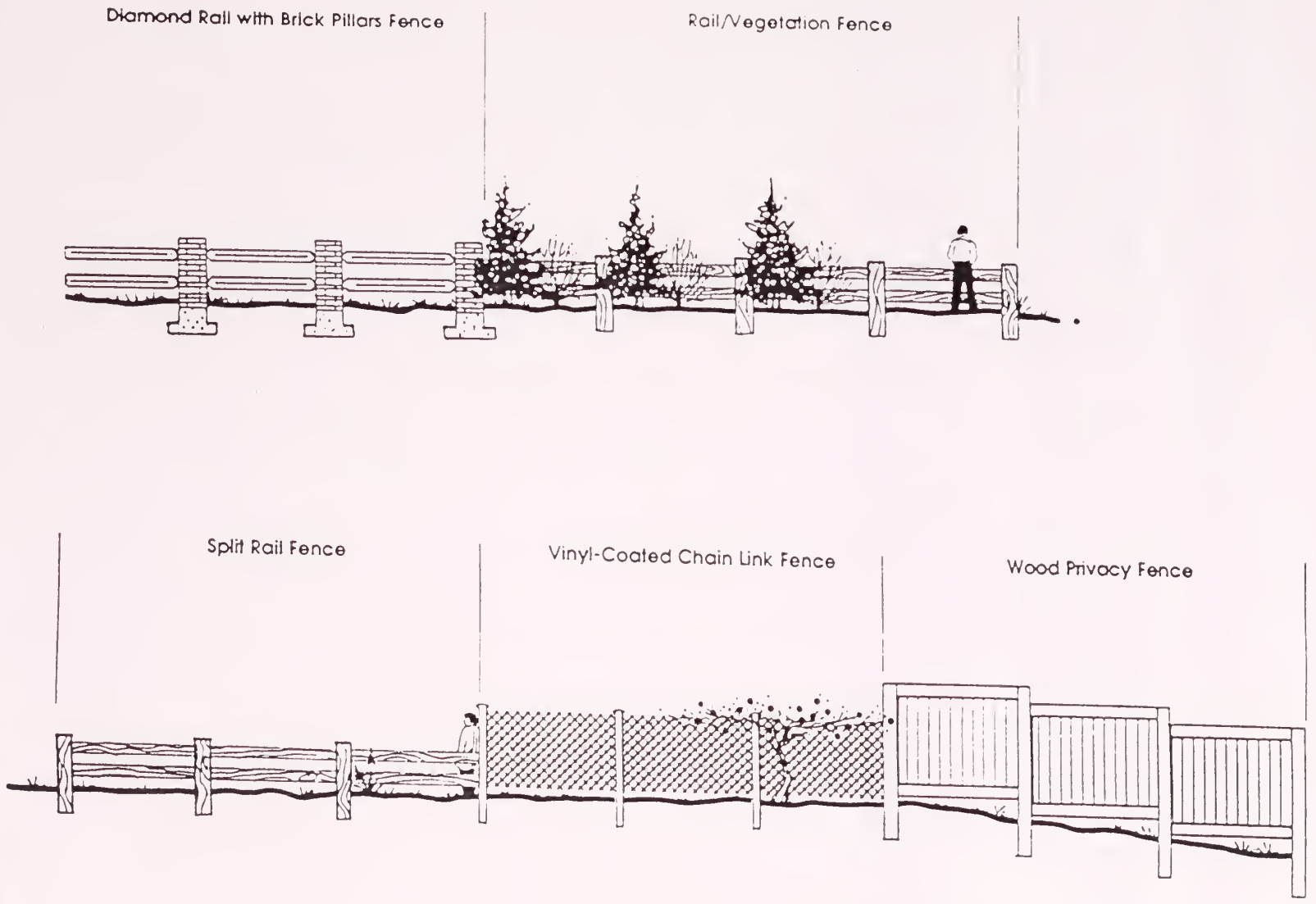
1) Land Use and Zoning Classifications and Amendments. As confirmed by the County Office of Planning and Development, those properties located within the jurisdiction of Alachua County have land use categories that range from varying densities of residential to conservation and recreation. Therefore, prior to obtaining permits for developing the greenway facilities, each of these parcels will need to be addressed individually (on a case-by-case basis) to ensure their existing or proposed land use is compatible with the existing adjacent land uses.

 The land use amendment procedure to be followed once a parcel of land has been acquired, has been established by the State of Florida, Department of Community Affairs (DCA), and is the same amendment process that all citizens and governmental bodies currently use for proposing amendments to their comprehensive plans. The state allows each governmental body, and the citizens within its jurisdiction, to submit applications twice a year for reviewing proposed comprehensive plan amendments. One or more amendment applications may be submitted for review during each of the review periods.

 In order to change the land use of a parcel within the greenway to the appropriate greenway land use, the City, or County, staff will, respectively prepare an amendment application on behalf of the applicant, the City of Gainesville, or Alachua County. Once the application is submitted, the review process will take approximately six to seven months. The first three months involves scheduling meetings and public hearings to review the proposed amendment by the City's agencies and citizenry. It will be determined during this time whether or not the amendment should be approved and submitted to the state for its review. If the amendment is not approved by the City, then the application is not forwarded to the DCA and the parcel's existing land use designation remains the same. However, if the amendment is approved by the City, it is submitted to the DCA for their 60 to 90 day review. Once the DCA's review is completed, the amendment is sent back to the City for final adoption of the amendment by the City Commission.

 Once appropriate land use designations are in place, rezoning or special use permits consistent with the land use designation may be required on a parcel by parcel basis. This may be done contemporaneously with or following land use redesignation.

 The County Office of Codes Enforcement states that " (greenway) uses must be clearly defined (on a case-by-case basis) for preliminary review, and a re-zoning or special use permit for a public use may be necessary if proposed uses are not consistent with current zoning categories."



TYPICAL GREENWAY FENCING

FIGURE 20

2) City and County site plan approvals, as per their Land Development Regulations from planning, traffic engineering, utilities, police, fire, environmental protection, engineering and building departments. Approvals have to also be obtained from the review agencies and commissions when required.

3) St. Johns River Water Management District permits, including a Wetland Resource Management permit for any dredging or filling in flood plains and a stormwater discharge permit for improvements, such as parking lots.

4) To meet the requirements of the State Statutes, the Florida Department of Historical Resources will require subsurface testing for the high, medium and low potential areas as well as a completed assessment of the significance of located sites. Compliance with these guidelines will be required prior to obtaining any permits for the project.

During the beginning of the site plan development phase, a list of all the licenses and permits required for implementing the site plan shall be submitted to the Florida Communities Trust. Prior to the initiation of construction, the applicant, City, or County, shall provide copies of all the required licenses and permits, as previously identified,to the Florida Communities Trust.

ENVIRONMENTAL MONITORING PLAN

ENVIRONMENTAL MONITORING PLAN

To a large extent, the environmental inventory work begun as a result of this project must be continued by the City and community at large in order to properly assess the long term effects of greenway development, both positives and potential negatives, on the Hogtown Creek basin environment.

First and foremost, a framework needs to be established within which biological and ecological changes can be readily observed and properly assessed. Second, their needs to be appropriate interface among greenway-specific monitoring programs with experts and programs now employed by the City, and through other local and state experts, including the University of Florida. Third, monitoring studies will be developed so that further inventory of flora, fauna and other natural resources are direct by-products. Fourth, monitoring must be cost and time efficient, and provide accessible information to local decision makers and adjacent landowners. Fifth, ecological evaluation will be a part of the "greenway experience" so that all users, regardless of age and educational background, can understand the interrelationships between humans and the environment.

As previously discussed, in order to develop the framework for the greenway's environmental monitoring plan and be able to efficiently interface with other professionals and governmental agencies, the plant and animal species found and monitored on the Project Site must be forwarded to the Florida Natural Areas Inventory (FNAI). This information can be provided by documenting the location of the plant and/or animal species on the Project Site, then completing an Element Occurrence Records form for each particular species found and sending this information to the FNAI office.

The best safeguard for protecting biological diversity and ecological integrity is to limit human encroachment and disturbance to the corridor landscape. Additionally, monitoring and maintaining the gross ecological integrity of the creek system will preserve a landscape for most of the plants and animals that live in the area. With this in mind, the overall greenway monitoring program will seek to regularly evaluate the following key aspects:

- Plant community structure, composition and dynamics
- Hydrology - flow rates, water levels, water quality, sources of runoff
- Soil moisture levels
- Animal occurrences and densities
- Bird occurrences, densities, nesting and reproductive success
- Exotic plant and animal densities
- Impacts of human use related to trail use and programming
- Type of trail use - hiking, biking, mountain biking, horseback riding

WATER QUALITY AND QUANTITY

The hydrology of Hogtown Creek is critical to the health of the creek-side ecosystem. Even though it might appear that the creek appears in good condition, following many years of uncontrolled runoff, pollution and general abuse, no one has attempted to maintain or improve the natural function of the creek ecosystem. Therefore, a more active attempt to maintain and improve the creek ecosystem is suggested. While aquatic vegetation responds most readily to phosphorus and other nutrients, the measurement of water quality in relation to animal health does not focus on nutrient availability, but on non availability and toxicity. The important elements that effect a creek system includes: minerals, heavy metal concentrations, turbidity and flow rates.

During the Consulting Team's evaluation of the corridor, signs of severe and sudden fluctuations in volume and flow rate were detected, probably due to the numerous runoff inputs, many of which collects rainwater on paved surface and deliver it quickly to the creek. Most native vertebrate creek fauna cannot tolerate frequent changes of this magnitude. Flow is the "major limiting factor to creek life" (Odum 1971). Flow meters are inexpensive, unobtrusive, and are recommended to be installed above important runoff entry points to the creek, with the goal of stabilization of hydrological regime. This stabilization does not rule out natural fluctuations. Seasonal and daily variation in flow is natural and essential to the success of invertebrates and fish (Mueller 1974). Other important variables simple to monitor are siltation rates and types, and evapotranspiration rates.

Monitoring activities related to stormwater quality are generally limited in Gainesville. The Hogtown Creek watershed has been the primary area of interest with respect to water quality due to the presence of an Environmental Protection Agency (EPA) Superfund site located on a tributary to the Springstead Creek Branch of the system. In addition, as part of the 201 wastewater facilities planning process, selected water quality data were compiled and limited field sampling was conducted as part of an investigation conducted at the University of Florida (Huber, et al. 1980; Source: City of Gainesville, Stormwater Management Master Plan,1992)

A U.S. Geologic Survey (USGS) stream gauge located at the outflow from Sugarfoot Prairie on SW 20th Avenue provides the only basis for evaluation of flood flow frequency conditions for the City. The primary station for obtaining published rainfall data is the Municipal Airport Station. The summary of rainfall data from that station is reported in Table 5, which provides monthly totals for 1991, 1990, and 1989; normal totals for the period of record; and record monthly totals and the years during which they occurred. As reported in Table 5, the normal annual total rainfall is 52.84 inches and the cumulative deficit, compared with that total over the past 3 years, is 10.92 inches. (Source: City of Gainesville, Stormwater Management Master Plan,1992)

NORMAL MONTHLY RAINFALL DATA
FOR THE
GAINESVILLE MUNICIPAL AIRPORT

	1989	1990	1991	Normal	Record
January	1.15	1.88	5.74	3.27	11.79 in 1904
February	1.99	2.86	0.32	3.91	7.92 in 1970
March	1.56	3.62	9.72	3.67	10.48 in 1959
April	1.34	3.67	5.73	2.94	8.95 in 1949
May	1.36	3.18	6.35	4.18	9.58 in 1965
June	10.66	9.05	5.40	6.63	15.74 in 1965
July	3.98	10.36	7.24	7.09	16.41 in 1909
August	7.81	8.10	5.10	7.99	15.15 in 1945
September	8.09	2.14	1.69	5.60	13.04 in 1964
October	3.12	3.51	1.40	2.33	10.00 in 1944
November	1.81	1.07	1.34	2.04	7.27 in 1972
December	4.02	1.39	1.39	3.19	9.22 in 1945
TOTAL	**46.36**	**50.83**	**50.41**	**52.84**	

TABLE 5

One of the most significant flooding events during the past several years occurred during September 1988. To provide a basis for comparing that storm event to the design storm conditions used for developing flood mapping data, observed hourly rainfall data published by the National Oceanic and Atmospheric Administration (NOAA) were obtained for the Gainesville station designated 3 WSW. The period of September 5th to the 8th was reported to have a cumulative total rainfall of 9.3 inches. Reviewing the hourly values, the most intense 24-hour period was found to cover the period from 11 p.m. on September 5th to 11 p.m. on September 6th, during which the total rainfall depth was 6.6 inches. (Source: City of Gainesville, Stormwater Management Master Plan, 1992)

The hourly values reported for this 24-hour period are plotted in Figure 21 along with the design storm values used to perform stream basin hydrologic analyses for flood mapping and basin planning. Although the total depth for this period, 6.6 inches, is close to the 10-year design storm depth of 6.8 inches, the slope of the steep portion of the curve is lower for the September storm than for the design storm. The most intense hour for the September storm produced 1.5 inches, while the most intense hour of the 10-year design storm produces 3.13 inches. For comparison, the 1-year, 1-hour rainfall for Gainesville is reported by the Weather Bureau to be 1.9 inches and the 10-year, 1-hour storm is 3.13 inches. (Source: City of Gainesville, Stormwater Management Master Plan, 1992)

Based on the NOAA data, the 4-day period of September 5th to the 8th, rainfall was essentially a 10-year storm based on total 4-day volume, but, based on peak-hour intensity, it was less than a 1-year storm and is therefore less severe than the standard design storm approach used to perform hydrologic analyses for the flood study update. (Source: City of Gainesville, Stormwater Management Master Plan, 1992)

In conclusion, although the September 1988 storm was a significant event, it was much less severe than the design storm conditions used for developing the flood maps and performing basin planning. (Source: City of Gainesville, Stormwater Management Master Plan, 1992)

To provide a better background on existing problems and a basis for modeling system conditions and facility performance, a two-part level of baseline monitoring is suggested. The two parts should match the requirements of the EPA and National Pollutant Discharge Elimination System (NPDES) regulations and should include both quantity and quality measurements. Water quality parameters monitored should be those required by the EPA permitting program. Suggested locations for monitoring stations include Possum Creek at NW 39th Avenue, Hogtown and Possum creeks at NW 16th Avenue, Hogtown Creek at the concrete weir near the Loblolly Environmental Education Facility, the outflow from Sugarfoot Prairie at the USGS gauge located on SW 20th Avenue, and selected outfall points from each of the remaining stream basins. At least one rain gauge should be located within the

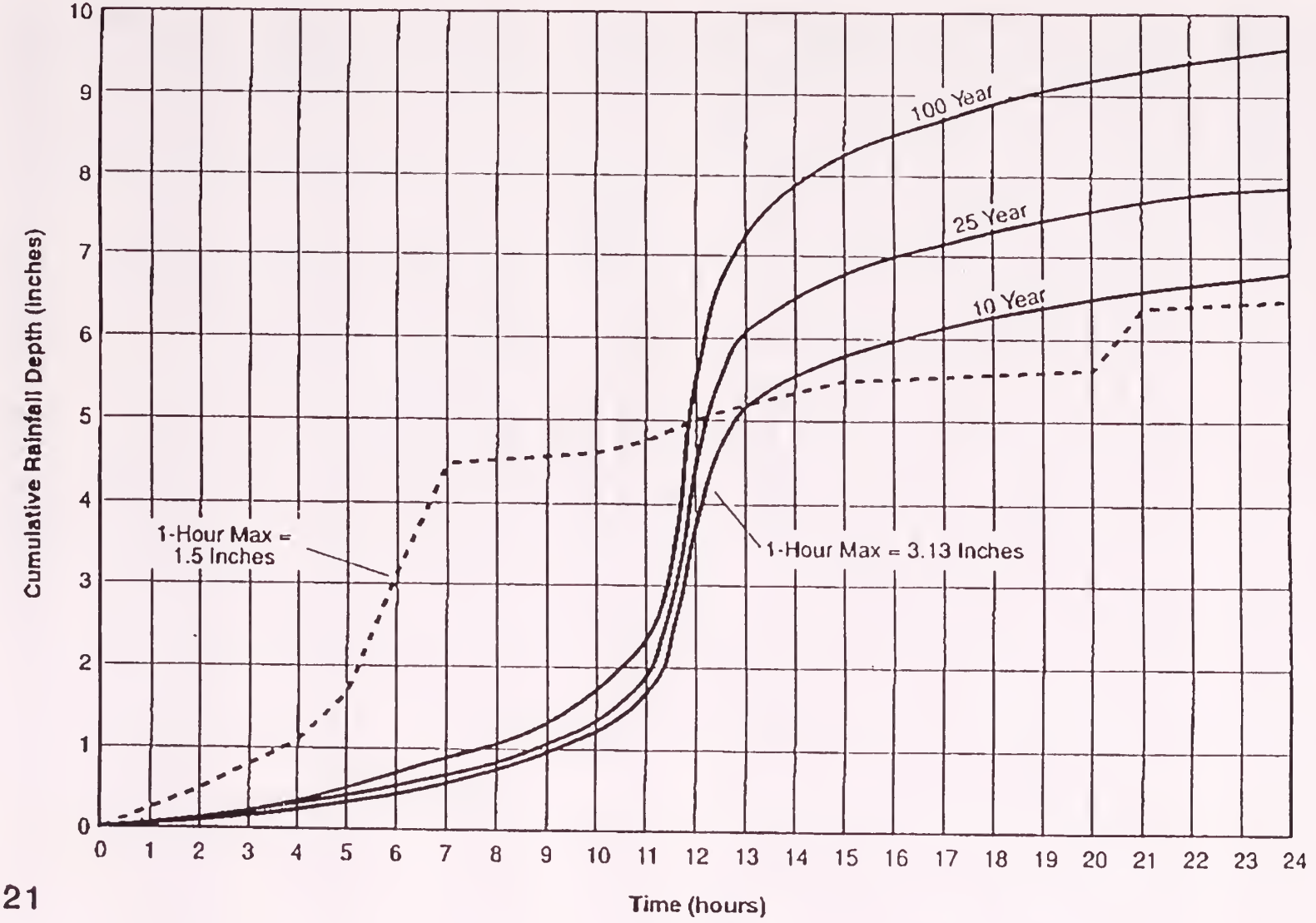


FIGURE 21

LEGEND

- - - - - Observed Hourly NOAA Data (Station 3 WSW) Beginning 11 PM Sept. 5, 1988 and Ending 11 PM Sept. 6, 1988

——— Design Storm Used for Flood Plain Study

Observed September 1988 and Design Storm Rainfall Data for Stream Basin Hydrologic Analysis.

Hogtown Creek watershed, probably in the vicinity of Westside Park, and a second gauge in the downtown area, probably at the Thomas Center. In addition, it would be advisable to collect inflow and outflow data for selected stormwater detention ponds throughout the City to evaluate system operation and performance factors. (Source: City of Gainesville, Stormwater Management Master Plan, 1992)

It is CH2M HILL's experience that, due to vandalism and security problems, stormwater sampling can generally be accomplished at comparable cost and with higher reliability by manual rather than automated methods. However, this requires an additional commitment of manpower to allow for quick mobilization so that runoff data can be collected immediately following the start of rainfall. Each storm event sampled should be preceded by at least a 72-hour dry period, during which no more than 0.1 inches of rainfall has been measured. If more than one storm event is sampled at a single outfall, it should be separated from the previous storm by at least one month. It also is desirable to sample stormwater quality during both the summer wet season and winter dry season. Stage-discharge control sections must be established to allow computations of flow rates to be accomplished. The combination of quantity and quality measurements will allow the calculation of pollutant loading information. If long-term quantity measurements are collected, flood frequency relationships can be compiled to further evaluate modeled predictions. (Source: City of Gainesville, Stormwater Management Master Plan, 1992)

Presently, there are eight proposed stormwater management projects in the Project Site, with goals of improving water quality in Hogtown Creek (Source: Gainesville Department of Community Development, 1992). These are illustrated on Map 12, and are briefly described as follows:

Sugarfoot Prairie - Designates a flood protection berm for the residential subdivisions that is scheduled to be completed in 1993. A modification to the culvert that connects the Prairie to Terwilliger Pond is expected to lower the flood elevation in the Prairie by approximately .5 feet.

Westgate Shopping Center - Proposed actions include modifications to the floodway channel, installation of bicycle/pedestrian trails, wet detention facilities parallel to the channel, and other facilities for water quality treatment.

Loblolly Environmental Education Facility - Includes installation of berms to create stormwater storage areas using existing topography of the natural creek system. To avoid stress to the woody vegetation, the duration and depth of flooding will be designed to allow natural levels to return within 24 to 48 hours.

Ridgewood Park - Includes a berm designed to protect this residential neighborhood from impacts of the 100-year storm.

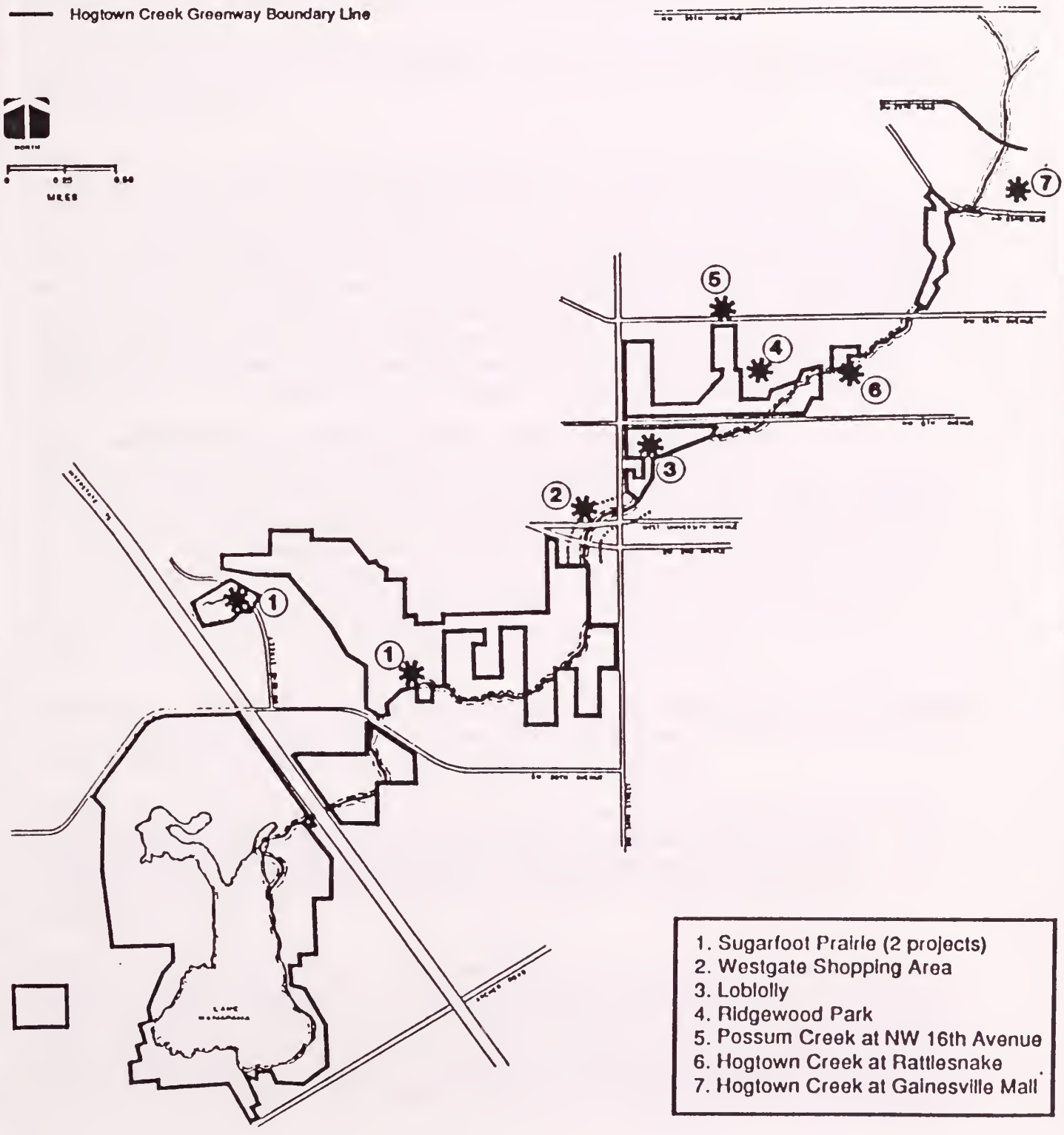
Proposed Stormwater Management Projects

Hogtown Creek Greenway

Gainesville, Florida

LEGEND

Hogtown Creek Greenway Boundary Line



1. Sugarfoot Prairie (2 projects)
2. Westgate Shopping Area
3. Loblolly
4. Ridgewood Park
5. Possum Creek at NW 16th Avenue
6. Hogtown Creek at Rattlesnake
7. Hogtown Creek at Gainesville Mall

Prepared by the
Department of Community Development
August 1992

MAP 12

Possum Creek at NW 16th Avenue - Might include replacing culvert at 16th Avenue to reduce backwater flooding of upstream homes.

Hogtown Creek at Rattlesnake Creek - Includes a berm designed to protect homes southwest of NW 16th Avenue and NW 22nd Avenue from flooding. The berm will divert flow to the Shands Swamp wetlands.

Hogtown Creek behind Gainesville Mall - Provides for the creation of a detention storage basin for this area to control overland runoff. Sediment trap is also a feature of the project.

Water quality can be effectively monitored by sampling certain species of benthos. The nymph of the gomphid dragonfly, an extensive creek bank burrowing species, is a good indicator of water quality -- while it can tolerate moderate levels of pollution, it is quite common and therefore easily collected. Some creek damselfly nymphs are also good water quality indicators and will be monitored. Both of these insects species are abundant on the creek bottom in the 8th Avenue bottomlands. Minnows will also be excellent candidates for monitoring since the are susceptible to changes in water quality and temperature. Densities of native versus exotic fresh water clams will also provide useful and interesting information on changes in water quality.

SOIL MOISTURE, COMPACTION AND LOSS LEVELS

Soil moisture levels will be monitored in selected areas around Lake Kanapaha in order to determine the humidity of microhabitats for shrews, bats, rodents, birds and soil dwelling insects. Soil compaction studies will be conducted on and adjacent to different greenway facilities. This data will help quantify the impact of both on and off-trail use by visitors on the soil structure and soil dwelling creatures. Soil loss along greenway trails will be measured on a regular basis. In addition, siltation rates will be measured in creek areas as a component of soil loss, water quality, and erosion monitoring.

PLANTS: COMMUNITY STRUCTURE, COMPOSITION & DYNAMICS

Several approaches proposed in this section address the diversity of community types, ecological problems and existing research programs.

Photopoints - A simple post and camera platform will be established at critical areas along the greenway to evaluate changes in vegetative communities. Over time a cumulative display of seasonal or annual photographs could be displayed adjacent to specific points or a collection could be displayed in an educational center.

Transects - These studies are recommended for areas in which ecotones occur, or where other distinct physical features intersect. Belt transects are proposed similar to those already conducted by Larry Johnson (1992). Transects of this type are particularly effective in measuring changes in the forest structure and species composition. A specific proposal for how these measurements are to be taken is included in the Appendix of this report. Transects will be permanently

marked with pieces of reinforcing steel bar at either end and temporarily marked with bamboo or plastic stakes every 5 meters. Photopoints should also be established at each end.

Plots - These studies are recommended for certain areas of the greenway that support distinct or unique habitats. Plots can be designed to accomplish many different goals and consideration will be given to each site before a plot is installed. Greenway plot studies, in general, will be 20 meters by 20 meters, and designed for monitoring at two-year time intervals. Plots can also be used to evaluate area responses to prescribed burns and exotics removal. A specific proposal for defining and measuring these plots is provided in the Appendix of this report.

Remote Sensing - Aerial photography/remote sensing is recommended as a means of monitoring vegetative cover on Lake Kanapaha. The importance of maintaining an even ration of closed plant cover to open water surface cannot be overemphasized. Annual or semi-annual overflights are conducted by the Florida Department of Transportation, and could provide adequate information to determine the status of the lake surface. It is very likely that this could be accomplished for not only Lake Kanapaha, but for the entire greenway.

MAMMALS: OCCURRENCES AND DENSITIES

The Consulting Team was unable to complete a thorough inventory and evaluation of mammal occurrences and densities due to time constraints. This baseline information must be completed by the City before effective monitoring can take place. A specific proposal for mammal sampling and evaluation is included in the Appendix of this report. Care and vigilance will be required to maintain the small mammal communities that most likely inhabit remaining forests of the Hogtown Creek basin. A hazard already threatening small mammal communities and the gopher tortoises is domestic predators. Dogs and cats will probably increase in presence on the greenway as connectivity and access points are increased, although the public purchase of properties within the project study area will prevent future conversion of such properties to the residential land uses most likely to increase domestic predators.

Horseback riders could enjoy the greenway if paths are included within the greenway for their use. Erosion along horse trails is generally more severe than any other form of non-motorized greenway use, and trails should not be installed on erodible slopes or near marsh landscapes. The open prairie north of Lake Kanapaha needs to be maintained either by frequent fires or controlled grazing. The latter may be easier and safer. Either privately owned horses or bison from Payne's Prairie would be suitable and probably aesthetically pleasing to most greenway visitors.

BIRDS: OCCURRENCES, DENSITIES, NESTING & REPRODUCTIONS

The greatest diversity of bird species will be maintained if: 1) vertical stratification is maintained; 2) the mosaic of different aquatic microhabitats are protected; and 3) the various nesting habitats currently used are not disturbed (Stouffer and Best, 1990). Bald eagles require solitary tall pine trees

for nesting. For the protection of the nest that exist around Lake Kanapaha and Sugarfoot Hammock, the United States Fish and Wildlife Department guidelines shall be followed. The guidelines include the establishment of a 750-foot diameter primary zone of "no disturbance" around the nest tree. In addition, a 1,500-foot diameter secondary zone will be established, allowing only minimal disturbance and no development that will interfere with the eagle's ability to freely access its hunting ground. Furthermore, maintaining natural vegetation structure and heterogeneity should be considered an overall management recommendation.

Monitoring bird occurrences, densities, nesting and reproductive success can best be accomplished through the assistance of local bird enthusiasts. Some of these groups and individuals are already involved in annual bird counts for areas within the greenway. A more systematic sampling of passerines can be obtained from repeated strip transects and mist netting. If the objectives are to determine their abundance, then systematic nest and call counts should be performed. As with mammals, there are some inconspicuous species that are impossible to monitor without extensive financial and time outlay.

Birds on open water are easily and accurately censused; careful counts should be conducted four times per year to note any changes in resident or migrant species. The prairie region of the greenway should be censused seasonally as it is a stopover for migrating sandhill cranes and possibly endangered whooping cranes.

REPTILES, AMPHIBIANS, FISH AND OTHER ORGANISMS

Gopher tortoises represent one of the few species occurring within the greenway that will benefit from direct management. All gopher tortoise areas should be marked with clear signs warning of penalties for harassment. A few other species merit special monitoring attention, including the dragonfly and damselfly species. In general, snakes, salamanders, skunks, frogs, toads, and numerous other organisms frequently inhabit dead standing and fallen trees, branches and piles of detritus on the ground or in the creek. Temporary pond sites are important to amphibian breeding and should be protected. These potential microhabitats should not be disturbed.

FACILITY MANAGMENT & MAINTENANCE

FACILITY MANAGEMENT AND MAINTENANCE

The City will adopt a clear and concise facility maintenance and management program for the Hogtown Creek Greenway. The objectives of this facility maintenance and management plan is to assure that the public's health and safety are protected during normal use of the greenway, and to restore the greenway landscape disturbed by facility development or prior abuse and neglect.

The Hogtown Creek Greenway will be classified by the City as a linear park, and will be formally maintained in a clean, safe and usable condition like all other parks within the city. Greenway lands will be maintained in a natural condition to the greatest extent possible, so that they may fulfill multiple functions including stormwater management, environmental and historical interpretation, wildlife habitat protection, passive recreation and alternative transportation.

FACILITY MAINTENANCE

Maintenance will include the removal of debris, trash, litter, obnoxious and unsafe man-made structures, and other foreign matter so as to make the greenway corridor safe for public use. Removal of vegetation will be done with discretion. The objective in controlling the growth of existing vegetation will be to maintain clear and open sight lines along the edge of the trail, and eliminate potential hazards that could occur due to natural growth, severe weather or other unacceptable conditions. For bicycle facilities, the American Association of State Highway Transportation Officials (AASHTO), the recognized legal authority on bicycle facility development in the United States, recommends that 2.5-foot clear zones be maintained on both sides of bikeway trails to provide room for maneuvering and sight distance. The City will remove all vegetation a minimum distance of three feet from each edge of the trail to maintain this nationally accepted standard.

Selective clearing of vegetation will be conducted within a zone that is defined as being between three to a minimum ten feet from each edge of the trail. At any point along the trail, a user will have a clear, unobstructed view, along the centerline of the trail, 300 feet ahead and behind his/her position. The only exception to this policy will be where terrain or curves in the trail serve as the limiting factor. Department of Cultural and Nature Operations will be responsible for the cutting and removal of vegetation. Removal of vegetation by individuals other than those persons employed by the City will be deemed unlawful and subject to fines and/or prosecution.

All trail surfaces will be maintained in a safe and usable manner at all times. Rough edges, severe bumps or depressions, cracked or uneven pavement, and volunteer vegetation occurring in the tread of the trail will be removed and replaced in such a manner so that the trail surface is maintained as a continuous, even and clean surface. The City will strive to minimize the

number of areas where ponding water occurs, however the municipal corporation will not be held liable for public use through areas of casual or ponded water.

In terms of control and maintenance of feral animals, these animals are uncommon in the Hogtown Creek Greenway's Phase I area. Due to the suburban nature of this area, stray animals do not have much of an opportunity to become feral as they are either picked up by Animal Control officers or killed by automobiles as they cross the network of roadways. Truly feral animals are located in the southern portion of the greenway and outside of the Phase I area.

If any feral animals are located in the greenway's Phase I area, live traps will be placed in the area that they are frequenting by the Habitat Naturalist. Once and animal has been trapped, Animal Control will be notified and animals will be disposed of in the prescribed manner.

Removal of feral animals from the Phase I Hogtown Creek Greenway will begin when these animals are discovered which will probably be when trail construction and public use begins. Removal will be on-going although it is expected that encounters with feral animals will diminish to a very low frequency after the first year that the greenway is open, as these animals will be trapped, driven out of the area, or killed on the adjacent roadways.

LANDSCAPE RESTORATION

During the development of greenway facilities, non-native invasive species will be removed, first from areas adjacent to trails, and eventually throughout the project area. The schedule for removal of such species will be based on the urgency associated with removal, the timing of land acquisitions, and the availability of staff, equipment and volunteers to accomplish the removal.

During removal of invasives, selective weeding will be used to encourage the growth of desirable species. Wildflower gardening principles, and installation of native species should be used to restore greenway landscapes. Because many areas within the greenway are highly disturbed already, and due to adjacent private land holdings, total control of invasive species will not be possible in all cases. The most environmentally significant lands, as well as designated restoration areas will be prioritized for control of such species. (Sources: Alachua Conservation Trust, 1992; Florida Department of Natural Resources, 1990).

Eradication of invasive exotic vegetation and subsequent replacement with native species will be an ongoing process. It is highly doubtful that some species of exotics such as Wandering Jew (Tradescantia fluminensis) or Air Potato (Dioscorea bulbifera) will ever be eliminated. However, it is vitally important that these species be kept in check or loss of native species may ensue.

Invasive exotic control will be accomplished by City's Cultural and Nature Operations (CNO) habitat management staff utilizing existing staff and volunteer groups. Staff and volunteers will assist in manual removal efforts. Legally approved systematic herbicides, such as Roundup, will also be used in areas where harm to surrounding native vegetation can be prevented. Application will be by the City's trained CNO staff.

The time frame for implementation of the exotic vegetation eradication program is scheduled to begin in January, 1994. At the end of 1994, CNO staff will develop an annual report on the eradication and revegetation efforts during the year. This will contain information of the exotic weeds removed, their amounts and locations in 1994 as well as the locations and types of exotic that will be scheduled for removal in 1995.

The amount of exotic weeds that can be removed from the Hogtown Creek Greenway area is dependent upon the following three factors: 1) Staffing, 2) Volunteer commitment and 3) Quantity of herbicides purchased.

Habitat Management staff involved in exotic weed removal and revegetation efforts will consist of the following:

Habitat Naturalist: This position will be involved in the logistical planning of the plant removal and revegetation projects and will be responsible for supervising all exotic control and revegetative project related work.

Permanent Full Time Nature Assistant: This position will apply herbicides to designated exotic and will oversee volunteers and other designated staff in the manual removal of exotic as well as revegetation projects.

Temporary Nature Assistants: Staff working in this capacity will assist in overseeing volunteers as well as participate in manual removal efforts of exotic vegetation.

Volunteers: Individuals and groups recruited by the Habitat Naturalist will assist in exotic plant removal and revegetation projects.

The amount of exotic weeds removed and areas restored will depend to a large part on the level of commitment given by the volunteers. A prioritized list will be maintained of areas (by greenway development phases) needed to be rid of exotic and restored to their natural state. Each section will be checked at the end of each year with an update on the priorities list for the next year. Improvement in the affected areas will be partially dependent on the number of man-hours volunteered and staff designated.

Herbicides will be used to remove invasive exotics with the amount being removed dependent upon the amount of funds allocated for the purchase of

herbicides and amount of time that the Nature Assistant will have to make the applications. If resources are provided it is recommended that a time allotment of four hours/week be spent during the months of April through September for herbicide application for the 1994 calendar year. This amount may need to be adjusted upward or downward for the following year with the projection made in the annual exotic weed removal report which will be submitted in December of each year. The Landscape and Tree Management section of the City's Land Development Code has also been amended to prohibit the planting of non-native invasive vegetation by new non-single family residential development within the City.

Cleaning and restoration of known dump sites will be accomplished in the early stages of greenway development. Public access to these areas will be restricted until clean-up and restoration is complete.

Three areas of the Project Site have suffered a significant amount of vegetative and erosion damage, primarily due to uncontrolled and excessive motor vehicle, motorcycle, and bicycle use and require extensive landscape restoration as part of greenway facility development. The three areas are: 1) Ridgewood Park; 2) Loblolly Environmental Education Facility and surrounding landscape; 3) Forest Park. (Source: Gainesville Department of Community Development, 1992).

ASSIGNMENT OF MAINTENANCE RESPONSIBILITIES

The principal coordinating agent for greenway maintenance will be the City of Gainesville Department of Cultural and Nature Operations. The operating budget for Nature Operations Division during Fiscal Year 1992-93 is $243,000, of which $100,000 is raised from admissions, special events and classes. The department is staffed by 8 full-time, 25 temporary, and 200 volunteer workers.

Gainesville Nature Operations Division Maintenance of vegetation along Glen Springs/Elks Club Lodge, Ring Park, Ridgewood Park, Loblolly Environmental Education Facility, Creekside Park, and Sugarfoot Prairie. Maintenance activities include trash collection; revegetation; repair and replacement of benches, signs, fences, tables, trash containers, and similar facilities; and removal of invasive and hazardous vegetation.

Gainesville Parks Division Maintenance of Green Acres Park and Westside Park, including the greenway as it occurs within these parks. Maintenance activities include trash collection; repair and replacement of benches, signs, fences, tables, trash containers, and similar facilities; and removal of invasive and hazardous vegetation.

Gainesville Public Works Department Maintenance of Westgate Shopping Center to Hogtown Prairie areas of the greenway; intersections (including bridges, culverts, drainage pipes) and access points at NW 23rd Ave., NW 16th Ave., NW 8th Ave., NW 34th St., W. University Ave., and SW 2nd Ave.; insect control (within City limits); parking lots; street lights; repair and replacement of damaged trail segments; maintenance of creek channel (within City limits).

Volunteer Trail Officers These officers are supervised by the Nature Operations Division of the Dept. of Cultural and Nature Operations and their maintenance activities along trails will include trash collection, minor vegetation pruning and removal, minor revegetation, trail and parking lot sweeping, removal of graffiti, minor facility repair and replacement.

Alachua County For areas outside the City of Gainesville, Alachua County will provide the City of Gainesville with a lease or an easement across County owned property to allow the City to develop and maintain the greenway as it occurs on County property.

In the event the City or County develops any contractual agreements regarding any lease of any interest, the operation of any concession, any change in character or use from the original intent, any sale or option, any use other than by a member of the general public, and/or management contracts of the Project Site with any non-governmental persons or organizations shall require the City, or County, to provide a 60 day prior written notice of such agreement to the Florida Communities Trust.

Listing of additional maintenance and management agents is provided in Table 6.

FACILITY MAINTENANCE AND MANAGEMENT COSTS

Several model maintenance and management programs exist throughout the United States which can serve as a reasonable guide to defining future costs for the Hogtown Creek Greenway. For example, Seattle, Washington spends an estimated $2,500.00 per mile to maintain close to 30-miles of urban greenways, many of which are bikeways. Boulder, Colorado spends $45,000 per year to maintain 5-miles of the urban, streamside Boulder Creek Greenway - a state-of-the-art greenway. Raleigh spends an estimated $11,000.00 per mile to maintain more than 30 miles of urban greenways that extend through a variety of landscapes within the community.

In order to accurately estimate maintenance and management costs, The Team concludes that trail maintenance and management will require the hiring of additional staff, and the appropriation of funds to cover equipment purchase, fuel and repair. The City may choose to spread the responsibility for greenway facility management to a number of agencies, to match current operating philosophy. Thus, the following annual cost estimates serve as a guide for budgeting maintenance and management activities for the fully developed 6-mile Hogtown Creek Greenway:

AGENCIES & INDIVIDUALS RESPONSIBLE FOR THE HOGTOWN CREEK GREENWAY

Agency or Department	Contact	Responsibility
Cultural & Nature Operations City of Gainesville	Dr. Lemuel Moore Director (904) 334-2197	Overall administrative management and development of the Hogtown Creek Greenway as described in the management and conceptual plan pertinent to the annual reporting procedures as set forth by Florida Communities Trust
Nature Operations Division, City of Gainesville	Steve Phillips, Manager of Nature Operations (904) 334-2197	Oversees the operation of the Hogtown Creek Greenway, Ring Park and the Loblolly Environmental Education Facility, as well as other City Nature Preserves and Passive Parks.
Parks Division, City of Gainesville	Patrick Byrne, Superintendant of Parks (904) 334-2171	Oversees the maintenance and landscaping of City-owned Active-Recreational land.
Department of Community Development, City of Gainesville	Norm Bowman, Director of Community Development (904) 334-2035	Oversees implementation of the comprehensive plan, including the enforcement of land development regulations.
Public Works Department City of Gainesville	Emery Swearingen, Director of Public Works (904) 334-2051	Oversees engineering, streets, surveyors, and stormwater improvements.
Traffic Engineering Department, City of Gainesville	Brian Kanely, P.E. City Traffic Engineer (904) 334-2130	Oversees roadway design/traffic engineering activitieswith F.D.O.T. and the Alachua County Public Works Department.
Department of Public Works, Alachua County	Ed Culpepper, Director of Public Works (904) 462-2147	Oversees the development and maintenace of County owned park land.
Alachua County Office of Environmental Protection	Chris Bird, Acting Director of Environmental Protection (904) 336-2442	Responsible for enforcement of environmental regulations and implementing the conservation element of comprehensive plan.
Department of Growth Management, Office of Planning, Alachua County	Kurt Larsen, Director, Department of Growth Management (904) 373-5249	Oversees drafting and implementation of the comprehensive plan, including land development regulations.

TABLE 6

Description of Maintenance/Mgmt Activity	Annual Costs
Routine stream channel maintenance (4/year)	$ 8,760.00
Sweeping/blowing debris from paved trail tread (24/year)	$17,520.00
Pick-up and removal of trash and debris (24/year)	$17,520.00
Weed control and vegetation management (6/year)	$10,950.00
Silt removal from paved trail tread and bridges (16/year)	$11,680.00
Mowing of 3-foot grass safe-zone along trail edge (36/year)	$26,280.00
Minor repairs to trail furniture and safety features	$ 5,000.00
Park Officer Patrol (bike mounted - annual position)	$30,000.00
Supplies for labor force	$ 2,500.00
Equipment fuel, repairs and replacement parts	$ 7,500.00
Grand Total 6-mile Hogtown Creek Greenway	**$ 137,710.00**
Cost per mile	***$ 19,672.85***

** will increase as project ages*

Some capital expenditures will also be required in the initial phases of greenway development to purchase new and specialized equipment. This would include for example:

All Terrain Bike for Officer Patrol (fully equipped)	$1,000.00
All Terrain Vehicle for Maintenance Crews	$8,500.00

GREENWAY SAFETY AND SECURITY

GREENWAY SAFETY AND SECURITY

Safety is a duty and obligation of all public facilities. Therefore, as design development documents are completed for the Hogtown Creek Greenway, appropriate local, State and Federal government agencies will review these plans and specifications to ensure that they meet all existing regulations that will ensure a safe public facility. The City Attorney and Risk Manager will review all final site design documents for each greenway facility to ensure that minimum requirements for the development of a safe public facility have been achieved. Greenway facilities will be designed for the user groups that have the highest safety needs, for this project that would be the novice cyclist, because of equipment and speed, and persons whose movement in the outdoors is dependent on the use of a wheelchair.

In order to provide a standard of care that offers reasonable and ordinary safety measures, the City of Gainesville will develop and implement a Safety and Security Program for the Hogtown Creek Greenway. This program will consist of well defined safety and security policies; the identification of trail management, law enforcement, emergency and fire protection agencies; the proper posting, notification and education of the trail user policies; and a system that offers timely response to the public for issues or problems that are related to safety and security. The City will implement a coordinated effort for safety and security between Cultural and Nature Operations, Police, Fire, Public Works and Legal Departments, as well as with local neighborhood watch associations and Adopt-a-Greenway organizations. Important components of the Safety and Security Program will include:

1) Establishment of a Safety Committee or Coordinator
2) Preparation of a Greenway Safety Manual
3) Establishment of User Rules and Regulations
4) Development of Greenway Emergency Procedures
5) Preparation of a Safety Checklist for the Greenway
6) Preparation of a Greenway User Response Form
7) A system for accident reporting and analysis
8) Regular Maintenance and Inspection Program
9) Site and Facility Development and Review
10) Public Information Program
11) Employee Training Program for Safety and Emergency Response
12) Ongoing Research and Evaluation of Program Objectives

The City will always discourage the general public from using any segment of the greenway that is under construction. Trail segments will not be considered officially opened for public use until such time as a formal dedication ceremony and official opening has been completed by authorized agents of the City. Individuals who use greenway segments that are under construction, without written permission from an authorized agent, will be deemed in violation of the Greenway Hours of Operation Policy.

GREENWAY HOURS OF OPERATION

That the Hogtown Creek Greenway will be operated like all other non-lighted City park and recreation facilities; that is, open for public use from Dawn to Dusk, 365 days a year, except as specifically designated by City Cultural and Nature Operations Department. The Team recommends that individuals who are found to be using these facilities after dusk and before dawn, will be deemed in violation of these hours of operation and subject to fines and/or prosecution.

GREENWAY USER RULES AND REGULATIONS

One of the emerging safety issues in greenway trail planning, design and development is multi-user conflict. Typically, these conflicts are caused by overuse of a greenway; however, other factors may be problematic including poorly designed and engineered trail alignments, inappropriate user behavior, or inadequate facility capacity. The most effective use management plan is a well conceived safety program that provides the individual user with a Code of Conduct for the greenway, sometimes called a Greenway Ordinance. Several multi-purpose greenway systems across the United States have adopted progressive ordinances for public use. The following Rules and Regulations will be implemented for the Hogtown Creek Greenway. These rules would be displayed in both brochures and on information signs throughout the greenway. These rules and regulations will be reviewed by the appropriate authorities and legally adopted by the City of Gainesville.

1) Be Courteous: All greenway users, including bicyclists, joggers, walkers, wheelchairs, skateboarders, skaters, picnickers and others, should be respectful of other users regardless of their activity, mode of travel, speed or level of skill. Never spook animals! This can be dangerous for you and other users! Respect the privacy of adjacent landowners!

2) Keep Right: Always stay to the right as you use the trail, or stay in the lane that has been designated for your user group. The exception to this rule occurs when you need to pass another user.

3) Pass on the Left: Pass others going in your direction on their left. Look ahead and behind to make sure that your lane is clear before you pull out and around the other user. Pass with ample separation. Do not move back to the right until you have safely gained distance and speed on the other user. Faster traffic should always yield to slower and on-coming traffic.

4) Give Audible Signal When Passing: All users should give a clear warning signal *before* passing. This signal may be produced by voice, bell or soft horn. Voice signals might include "Passing on your left!" or "Cyclist on your left!" Always be courteous when providing the audible signal - profanity is unwarranted and unappreciated.

5) Be Predictable: Travel in a consistent and predictable manner. Always look behind before changing position on the trail, regardless of your mode of travel.

6) Control Your Bicycle or Skates: Inattention, even for an instant can cause disaster -- always stay alert! Maintain a safe and legal speed of less than 15 miles per hour at all times.

7) Don't Block the Trail: When in a group, including your pets, use no more than half the trailway, so as not to block the flow of other users. If your group is approached by users from both directions, form a single line, or stop and move to the far right edge of the trail to allow safe passage by these users.

8) Yield when Entering or Crossing Trails: When entering or crossing a trail at uncontrolled intersections, yield to traffic already using the other trail.

9) The Use of Lights: When using a trail around dawn or dusk be equipped with proper lights. Cyclists should have a white light that is visible from 500 feet to the front, and a red or amber light that is visible from 500 feet to the rear. Other trail users should use white lights (bright flashlights) visible 250 feet to the front, and wear light or reflective clothing.

10) Bad Weather: Greenway trails are mostly in the floodplain. You should not use trails, especially those along the larger branches and creeks, just before, during, or up to several hours after periods of heavy rains.

11) Don't Use this Trail Under the Influence of Alcohol or Drugs: It is illegal to use this trail if you have consumed alcohol in excess of the statutory limits, or if you have consumed illegal drugs. Persons who use a prescribed medication should check with their doctor or pharmacist to ensure that it will not impair their ability to safely operate a bicycle or other wheeled vehicle.

12) Clean-up Your Litter: Please keep this trail clean and neat for other users to enjoy. Do not leave glass, paper, cans or any other debris on or near the trail. Please clean up after your pets. Pack out what you bring in -- and remember to always recycle your trash.

13) Keep Pets on Leashes: All pets must be kept on secure and tethered leash. Failure to do so will result in fines and possible detention of the pet.

Share the Trail! Always exercise due care and caution when using the trail!

POLICE/PARK OFFICER PATROL AND EMERGENCY RESPONSE

In order to provide effective patrol and emergency response to the needs of trail users, and adjacent property owners, the City of Gainesville Police Department, the Alachua County Sheriffs Department and the Department of Cultural and Nature Operations will work together to develop a specific patrol and emergency response plan for the Hogtown Creek Greenway. This plan will define a cooperative law enforcement strategy for the greenway based on the capabilities of different agencies and services typically required for the facility. The City will develop a site plan for law enforcement and emergency response agencies that illustrates points of access to the trail; provides design details for making these access points safe, secure and accessible to law enforcement officials; and defines where a system of cellular-type emergency phones will be located. The City will also consider purchasing specialized equipment, as recommended in the Facility Maintenance section of this report, to improve the ability to access various environments of the greenway.

The City will also define an emergency response system in conjunction with appropriate local Fire Stations and Paramedical units. An emergency response system will define which agencies will respond to 911 calls, and should provide easy-to-understand routing plans and access points for emergency vehicles. Local hospitals will be notified of these routes so that they may also be familiar with the size and scope of the project. The asphalt paved, multi-use trail system will be designed and developed to support a maximum gross vehicle weight of 6.5 tons. Other portions of the trail system, including boardwalks and non-paved trails, will be capable of supporting light-weight All Terrain Vehicles (ATV).

MAJOR ROADWAY CROSSINGS

The crossing of major roadways is one of the biggest public safety issues of the project for trail users, and will require more careful evaluation during the design development stage. Additionally, providing safe crossing for wildlife is also a concern. From north to south, the major roadway crossings identified by the Team at this time include:

NW 23rd Boulevard
NW 16th Avenue
NW 8th Avenue
NW 34th Street
W. University Avenue
SW 2nd Avenue
SW 20th Avenue
Interstate 75
SW Archer Road
SW 62nd Boulevard

It is not possible to recommend a single type of crossing for all intersections. A detailed evaluation of each crossing will be necessary in order to determine the safest and most efficient crossing. Several types of roadway crossings will

need to be more thoroughly evaluated by the City Traffic Engineering Department including:

- at-grade uncontrolled intersections
- at-grade controlled intersections
- at-grade with median intersections
- grade separated underpasses
- grade separated overpasses

At-grade intersections are likely to be the most commonly recommended crossing for most of the roadways. In order to facilitate a safe crossing, the City will need to have a "Gap Analysis" performed for each intersection to determine the amount of time that exists for safe trail user crossing (See Table 7). Once the gap analysis has been completed, the City will be better able to understand the opportunities for at-grade or grade-separated crossings.

Grade-separated underpasses are possible for some crossings, but will be difficult to install due to the high water table and frequent flooding of the greenway lands. Overpasses are more suitable in Florida for high traffic intersections. This type of crossing has been used frequently in Pinellas County for the rail-trail greenway. Overpass design that utilizes terraced ramps and which effectively channels trail users onto the overpass will alleviate most concerns that are typically expressed about overpasses. However, these are only cost effective at crossings which carry large volumes of greenway users, where an at-grade crossing is extremely difficult or impossible due to traffic hazards, or both.

To a limited extent, wildlife crossings are currently provided by drainage culverts. However, detailed examination of some roadways by University of Florida students reveals that frequent road kills occur at several crossings, which may indicate the need for additional wildlife-friendly culverts to facilitate wildlife movement. During our evaluation of roadway crossing, the Team identified these areas and defined the most appropriate method for accommodating this need through greenway development.

Intersection Inventory

Intersection	Traffic Count ('90-'91)	Class	Sight Distance	Width of Road	Bike Lane/ Sidewalk	Median	Avg Speed	Street Maintenance	Notes
NW 23rd Ave (1600 blk)	11,074	Arterial	East = Fair West = Fair	30 ft	Sidewalk (one side only)	None	37	County	Glen Springs entrance
NW 16th Avenue (2700 blk)	21,290	Arterial	East = Fair West = Poor	70 ft	Sidewalk	Grass	46	County	
NW 8th Avenue (3100 blk)	13,792	Collector	East = Good West =Good	44 ft	Sidewalk	None	49	City	
NW 34th Street (100 blk)	24,937	Arterial	North = Good South = Fair	95 ft	Sidewalk	Continuous Left Turn	36	State	Road work in planning stage
W. University Ave (3500 blk)	24,384	Arterial	East = Fair West = Fair	68 ft	Sidewalk	Continuous Left Turn	33	State	
SW 2nd Avenue (3500 blk)	15,720	Arterial	East = Fair West = Fair	27 ft	Sidewalk (one side only)	None	32	State	Road work '93-'94
SW 20th Avenue (4500 blk)	19,707	Arterial	East = Good West = Fair	33 ft	Bike Lane Sdwk 1-side only	None	41	County	Road work in planning stage
I-75 (5000 blk)	39,737	Interstate	N.A.	> 100 ft	N.A.	Grass	55 (posted)	State	Being widened to 6 lanes
SW Archer Road (6200 blk)	16,822	Arterial	East = Good West = Good	83 ft	Bike Lane Sidewalk	Grass	45 (posted)	State	Recently widened to 4 lanes with bike lanes, sidewalks
SW 62nd Blvd (500 blk)	15,377	Collector	North = Fair South = Good	26 ft	Sidewalk (one side only)	None	42	City	

7/14/93

TABLE 7

RISK MANAGEMENT AND LIABILITY

RISK MANAGEMENT AND LIABILITY

Regardless of how well a greenway or any public facility has been designed and developed, there will always be some risk associated with its presence and usage. Therefore the design, development and management of facilities within the Hogtown Creek Greenway must be carefully and accurately executed in order to provide a resource that protects the health and welfare of the public.

Liability most often occurs when a facility has been under-designed to handle its intended or expected volume of use; when management of the facility is poor; or when unexpected accidents occur because the trail manager failed to recognize the possibilities of a potentially hazardous situation. To reduce the exposure to liability, the City of Gainesville will have in place the following measures prior to opening the first segment of the trail:

1) a complete maintenance program that provides the appropriate duty or level of care to greenway users;
2) a risk management plan and insurance policy that appropriately covers all aspects of the trail, and if appropriate, adjacent landowners;
3) a comprehensive working knowledge of public use laws and recent case history applicable in Florida.

Public use of the greenway will be covered under existing municipal policies for the use of park land and public spaces. The City will exercise reasonable care in the construction of all greenway facilities to reduce hazardous, public nuisance and life-threatening situations. The greenway is available for public use as defined by the Hours of Operation Policy. Any individual found using the trail outside the normal hours of operation will not be covered by the municipal liability policies for public use.

POTENTIAL IMPACT ON MUNICIPAL INSURANCE

The issue of liability as it relates to insurance is a common question for all greenway projects in the United States. The Consulting Team has investigated the facts of liability insurance coverage, and examined a detailed report completed by Mr. Timms Fowler, Esq. of Colorado, entitled "Private Landowner Liability and Urban Trail Development in Colorado." This is one of the most comprehensive reports on the subject of trail liability. The Team has also discussed municipal liability with representatives of the Frontier Insurance Company in New York, which underwrites Commercial General Liability Coverage for private organizations that sponsor greenway projects.

Based on our research, the Team has found that the City of Gainesville will not necessarily be exposed to any greater liability through the development and operation of the greenway than through development of any other public facility -- a public gymnasium, softball field or public park. The City of Gainesville Risk Manager will review all design development documents for all greenway facilities prior to their completion to ensure that they satisfy the current level of liability exposure and coverage.

PILOT PROJECT DEVELOPMENT COSTS

PILOT PROJECT DEVELOPMENT COSTS

The Team and the City have given careful consideration to the results of the Design Charette, and a potential application for ISTEA enhancement funding through the State of Florida Department of Transportation. After meeting with both FDOT officials and the North Central Florida Regional Planning Council, we have selected a portion of the Hogtown Creek Greenway study corridor for a pilot project. Our selection is based primarily on the fact that most of the land is already publicly owned, and facility needs have been most clearly articulated. In addition, Dr. Gary Hankins has expressed interest in selling a parcel of land to the City, which could resolve one of the more controversial portions of the proposed project, enabling broader community support for greenway implementation. Finally, this pilot project area has to be subject to intense scrutiny by the local neighborhoods, therefore successful implementation of this pilot project location could prove beneficial to future implementation of other greenway Project Sites.

The Team has selected the area between the north end of the Westgate Shopping Center and the Elks Club Lodge for consideration as the pilot project.

POSSIBLE PILOT PROJECT FACILITIES

The pilot project will include the purchase and development of the Elks Club Lodge into a trail head and cultural center for the greenway. It also proposes improvements to parking and facility needs of the Loblolly Environmental Education Facility. As a transportation improvement project, this pilot project will offer important bicycle and pedestrian linkages between neighborhoods, schools, shopping centers, enabling the City to offer local residents a choice in utilitarian travel. This section of the proposed greenway will also provide safe and designated connections to Gainesville High School, Westwood Middle School, and Littlewood Elementary School. It also offers the potential to link Alfred A. Ring Park and Westside Park with adjacent neighborhoods. Finally, a stormwater detention facility is proposed by the City for installation on City-owned property southwest of the corner of NW 34 Street and NW 8th Avenue. This could provide water quality improvements and flood protection for downstream properties.

Facility development will include the construction of 8,600 linear feet (1.63 miles) of a 10-foot wide off-road multi-use trail and 8,100 linear feet (1.53 miles) of on-road bikeway and pedestrian facilities from the Elks Club Lodge through the Loblolly Environmental Education Facility to Westgate Shopping Center. Improvements to existing roadways that provide on-road routing of the trail will be minimal. Since this segment of the greenway will primarily serve nearby neighborhoods within biking and walking distance, and due to existing parking facilities at Westside Park, Westgate Shopping Center and public schools, only a small, 20-car public parking lot will need to be provided at the Elks Club Lodge to serve both Alfred A. Ring Park and the greenway, and a formal 5-car lot, will be developed at the Environmental Education Facility.

The only major drainage structure in this stretch will be an extension of the existing box culvert at Hogtown Creek and NW 8th Avenue. In addition, the roadway berm along NW 8th Avenue will need to be extended out from the sidewalk by at least 10 feet to provide for a parallel multi-use trail facility.

Through the Possum Creek Open Space, a small portion of which is currently targeted for acquisition by the Alachua Conservation Trust and City of Gainesville, a combination of bermed multi-use trails and boardwalks will provide a defined route of travel from NW 16th Avenue to NW 8th Avenue.

PILOT PROJECT COST ESTIMATES

•11,600 linear feet of off-road 10-foot wide multi-use trail	$290,000.00
•6,100 linear feet of on-road bikeway/pedestrian trail	$ 50,000.00
•Street crossings of NW16th Avenue	$ 7,500.00
•6,000 cubic yards of fill material along 8th Avenue	$ 25,800.00
•Grading for trail through floodplain	$ 30,000.00
•Boardwalks through floodplain	$150,000.00
•Addition to Hogtown Creek box culvert	$ 20,000.00
•14-ft. 50 ft. long Cor-Ten Bridge @ Loblolly	$ 25,000.00
•14-ft. 100 ft. long Cor-Ten Bridge @ Westgate	$ 90,000.00
•Improvements to parking at Elks Club Lodge	$ 15,000.00
•5-car parking lot at Loblolly Envmntal Educ. Facility	$ 5,000.00
•Signage for entire route	$ 15,000.00
•Plant and animal habitat restoration	$ 30,000.00
•Trail Amenities	$ 10,000.00
•Stormwater drainage and management	$ 10,000.00
•20% Contingency	$154,000.00
•10% Design, Engineering and C. M. Fees	$100,000.00
•5% Regulatory Permit Fees	$ 20,000.00
Grand Total	**$ 1,047,300.00**

SOURCES OF FUNDING FOR DEVELOPMENT

SOURCES OF FUNDING FOR DEVELOPMENT

The City of Gainesville has identified five sources of funding to meet the cash match for the FCT grant, and proceed with development of a pilot portion of the Hogtown Creek Greenway.

GREENSPACE TRUST FUND- This fund was created in 1982 for the purpose of acquiring land for parks and greenspace in and around Gainesville. Since then, expenditures of $1.89 million have been made for 529 acres of parks and greenspace. The unencumbered balance in this fund was $326,192.00 as of October 1, 1991. The adopted Gainesville Comprehensive Plan mandates the funding level:

City Policy 1.1.4 The City shall annually allocate for the next 10 years a minimum of $150,000 for the purchase of recreation sites and environmentally sensitive lands. These lands shall be used for recreation, conservation, preservation, open space, and for regional watersheds in accordance with criteria developed in the Recreation Element and the Conservation, Open Space, and Groundwater Recharge Element of the Plan. (Source: Gainesville Comprehensive Plan: Future Land Use Element, also Conservation Element)

STORMWATER UTILITY FUND - Revenues from this fund are derived from a fee based on impervious area of developed land, and paid for by both residential and commercial landowners. Certain parcels along the greenway are ideal to acquire for multiple uses, including recreation, conservation, and stormwater management. Therefore, some stormwater utility funds may be used for certain acquisitions. Operating revenues in this fund for the City's 1991 fiscal year were $2,179,000.

MUNICIPAL BOND ISSUE - By Resolution adopted on November 18, 1991, the City of Gainesville has pledged $1.5 million dollars in matching funds for this project. All or part of these funds will be derived from a $12.4 million dollar tax exempt bond issue, which closed on or about March 10, 1992. The bonds will be issues through the First Florida Government Financing Commission and will be a pooled financing of four local governments: the City of Gainesville, Broward County, the City of St. Petersburg and the City of Sarasota. The City of Gainesville's portion of the bonds will be backed by a commitment to appropriate City non-ad valorem revenues.

SWAP/DONATION OF LAND - In at least one instance, the City may be compelled to swap current City-owned land for more desirable land within the greenway corridor. While FCT rules do not allow for land acquired prior to November 4, 1991, to be included as an in-kind match for cash, in cases where the value of the land to be swapped is integral to the transaction, it is hoped that the rules will be interpreted to allow the value of the land to part of the City's consideration. If this interpretation is allowed, the City's participation would be increased by approximately $50,000. If this is disallowed, it will not reduce the City's ability to provide its full share of the cash match.

ALACHUA COUNTY FINANCIAL PARTICIPATION

Alachua County agreed by Resolution 92-100, adopted October 13, 1992, to participate in a joint application with the City of Gainesville for Florida Communities Trust funding for the Hogtown Creek Greenway Project. The Alachua County Board of County Commissioners has agreed to fund acquisition of tax parcel #06909-000-000 from the Commercial Hazardous Waste Facilities Tax Fund #1547 in an amount up to $75,000, contingent upon an award of equal or greater match funding by the State of Florida and also contingent upon the use of a portion of this parcel to construct a road to provide access to the Kanapaha Botanical Gardens. The road will run from Archer Road to the Kanapaha Botanical Gardens at its southeastern boundary and link to current parking facilities at the Gardens. This road will provide improved access to the Gardens as well as access and additional parking to serve the greenway at its southern terminus.

INTERMODAL SURFACE TRANSPORTATION EFFICIENCY ACT (ISTEA) FUNDING

As a transportation facility that promotes effective linkage between neighborhoods, area schools, community destinations and other transportation facilities, facility development of the Hogtown Creek Greenway could be eligible for funding under the Florida DOT ISTEA Enhancements Program. A grant application should be submitted to enter the proposed greenway pilot project for Fiscal Year 1994 funding cycle.

ADDITIONAL POTENTIAL FUNDING SOURCES

Other potential sources of funding for acquisition and development of greenway facilities could include:

- State Conservation and Recreation Land (CARL) grants
- Water Management District grants
- County Bed and Entertainment taxes
- Federal Land and Water Conservation grants
- Impact Fees
- Private Donations
- Revenues from Promotional Events
- Allocations from the City and County General Fund
- Local Option Sales Tax

The above programs are potential funding sources that are primarily used for the acquisition of lands. However, the City has committed, through its General Fund, for the next three years a total $159,500 for Phase I "development" of the Project Site. The annual allocation is as follows:

- Greenspace Trust Fund
- Stormwater Utility Fund
- Allocations from the City General Fund
- Revenues from Promotional Events

PHASING PLAN FOR IMPLEMENTETION

PHASING PLAN FOR IMPLEMENTATION

A Phasing Plan for the Hogtown Creek Greenway is difficult to achieve because land acquisition is still in progress. Without the land, or rights to make use of properties, greenway facilities and programs become a moot point -- unless provided by private-sector interests.

To secure the future success of the entire greenway, a pilot project will be implemented as soon as feasible. This pilot project will be feasible - which means "don't bite off more than you can chew." At the same time, don't underestimate the abilities and resources of the community. The best pilot greenway projects are those that have clearly defined points of origin and destination - otherwise regarded as end points. It is also very important that the pilot project exemplify the full scope and function of the community greenway concept. Critical mass is important in defining pilot greenway projects; without an ample supply of potential users the greenway facility could be underutilized. Therefore, location is an important consideration. Finally, it is much easier to develop a pilot project where a majority of land, or land rights, are in public ownership.

THE PILOT PROJECT:
The proposed estimated time line for implementing structural improvements for this phase is 1994 - 1998 at an estimated cost of $1.05 million. The following areas will be included in this phase:

- Elks Club Lodge to Westgate Shopping Center
- Environmental Restoration at Gainesville Mall

PHASE II DEVELOPMENT:
The proposed estimated time line for implementing structural improvements for this phase is 1999 - 2002 at an estimated cost of $1.5 million. The following areas will be included in this phase:

- Burch Property to Green Acre Park
- Sugarfoot Prairie to Forest Park Facilities and Programs
- Creekside Mall to University of Florida Access

PHASE III DEVELOPMENT:
The proposed estimated time line for implementing structural improvements for this phase is 2003 - 2005 at an estimated cost of $0.75 million. The following areas will be included in this phase:

- Oaks Mall Access
- Forest Park to Hogtown Prairie and Lake Kanapaha Facilities and Programs

PHASE IV DEVELOPMENT:

The proposed estimated time line for implementing structural improvements for this phase is 2005 - 2010 at an estimated cost of $1.75 million. The following areas will be included in this phase:

- Lake Kanapaha Facilities and Ecotourism Programs
- Westgate and Creekside Mall

HOGTOWN CREEK GREENWAY

Preferred Design Concept

PREPARED FOR:

CITY OF GAINESVILLE, FLORIDA
DEPT. OF CULTURAL AND NATURE OPERATIONS

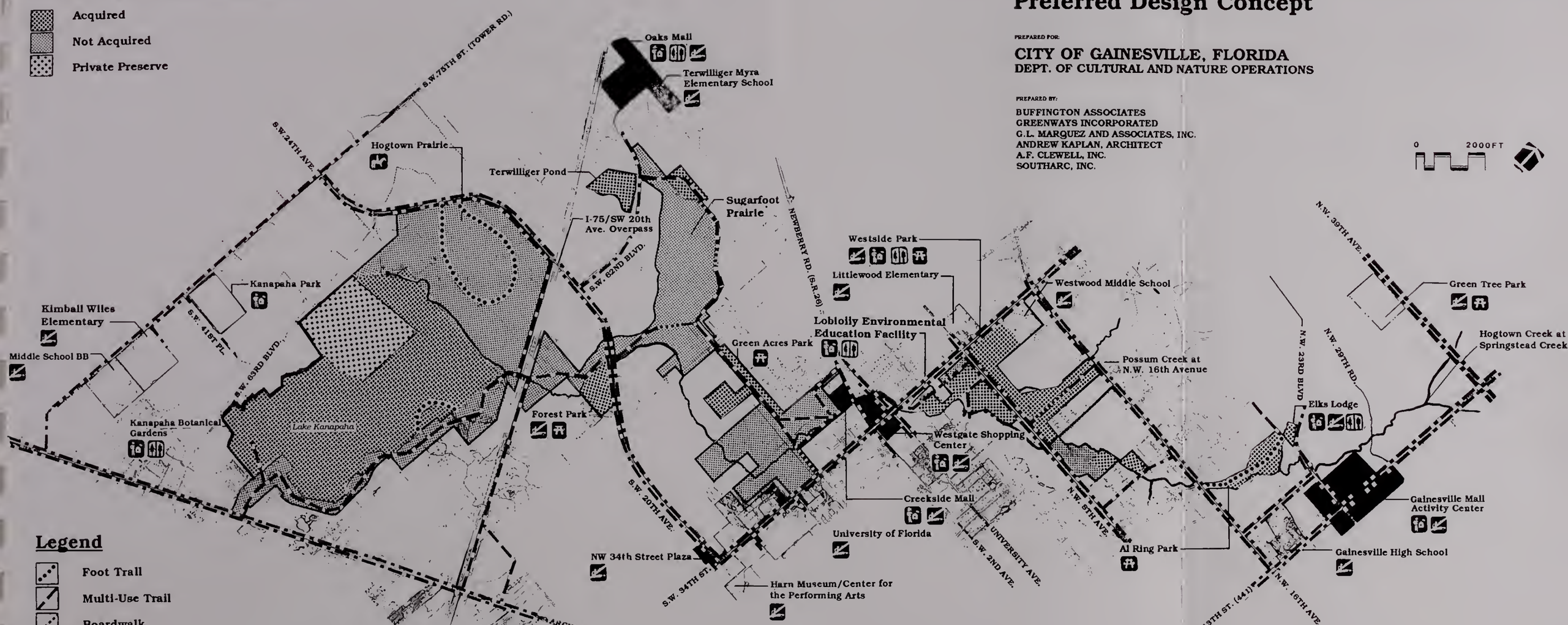
PREPARED BY:

BUFFINGTON ASSOCIATES
GREENWAYS INCORPORATED
G.L. MARQUEZ AND ASSOCIATES, INC.
ANDREW KAPLAN, ARCHITECT
A.F. CLEWELL, INC.
SOUTHARC, INC.

0 2000FT

Property Acquisition Status

- Acquired
- Not Acquired
- Private Preserve



Legend

- Foot Trail
- Multi-Use Trail
- Boardwalk
- Existing on/off Road Facilities
- Park and Bike
- Trail Heads
- Rest Room
- Equestrian
- Picnic Area

MAP 13

APPENDIX
A

HOGTOWN CREEK GREENWAY

ECOLOGICAL SURVEY
&
MANAGEMENT RECOMMENDATIONS

HOGTOWN CREEK GREENWAY

ECOLOGICAL SURVEY AND MANAGEMENT RECOMMENDATIONS

July 6, 1993

Peter Alcorn
Wild Things, Inc.

and

Reed Beaman
A.F. Clewell, Inc.

Wild Things, Inc. and A.F. Clewell, Inc. conducted baseline ecological surveys throughout the Hogtown Creek Greenway site. The results of those surveys are presented in the following pages. Some of this work was a continuation of plant and animal inventory work conducted in 1991 by Wild Things, Inc.

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TABLE OF CONTENTS

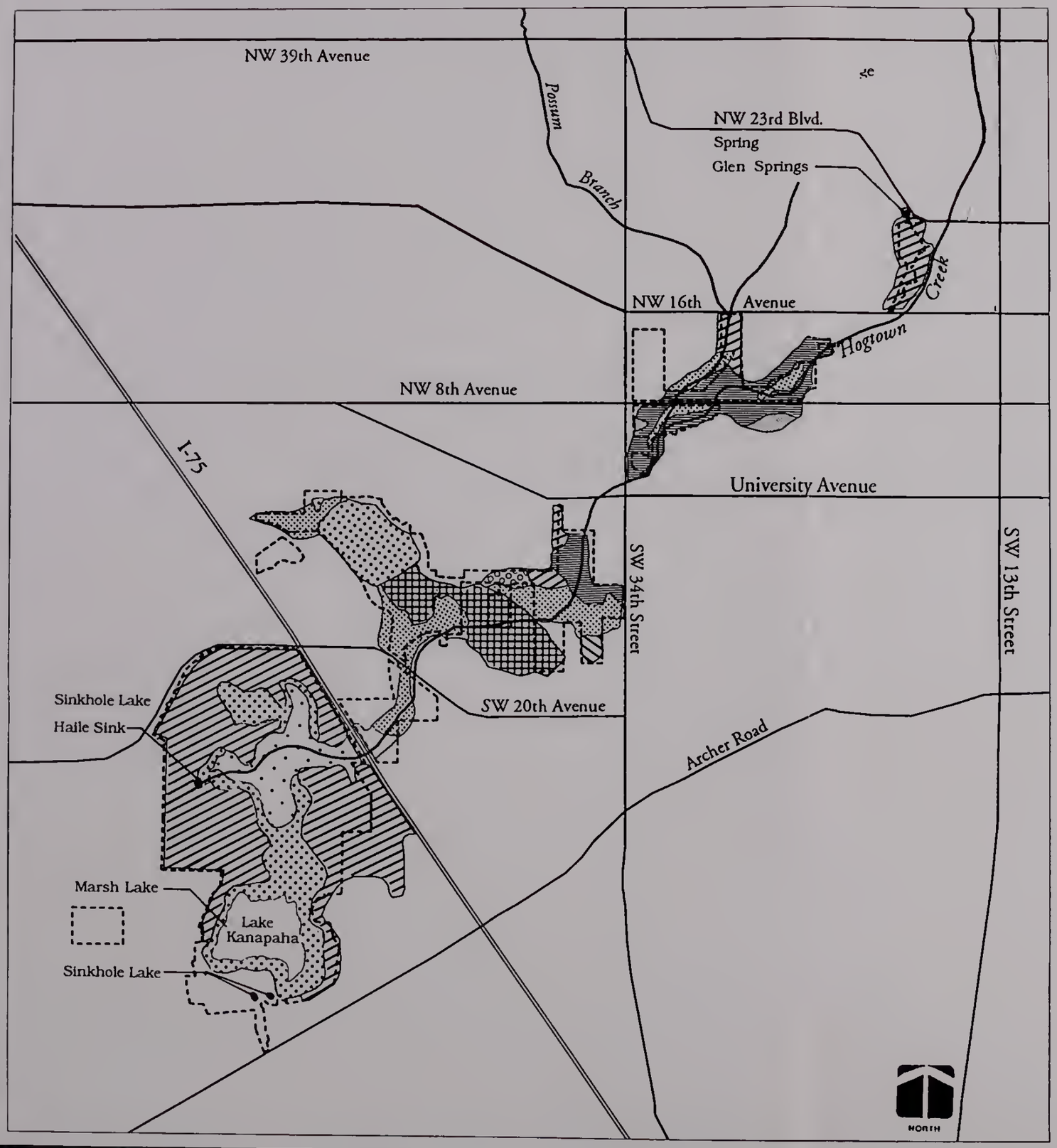
Preface 4
MAP I 5
MAP II 6
MAP III 7
ECOLOGICAL DESCRIPTION OF THE GREENWAY 8
Flora of Hogtown Creek Greenway 8
Natural Community Types 11
Spring-run Stream 12
Seepage Stream 12
Blackwater Stream 12
Upland Mixed Forest 12
Bottomland Forest 13
Floodplain Forest 13
Floodplain Marsh 15
Floodplain Swamp 16
Basin Marsh 16
Basin Swamp 17
Marsh Lake 17
Sinkhole Lake 18
Xeric Hammock 18
Sandhill 19
Fauna of the Hogtown Creek Greenway 19
Mammals 20
Birds 21
Reptiles, Amphibians and Fish 22
Crustaceans, Mollusks and Insects 23
CONCLUSIONS AND MANAGEMENT RECOMMENDATIONS 27
General Conclusions 27
Monitoring Environmental Change in the Greenway 31
Water Quality 32
Soil moisture, compaction and loss levels; 34
Plants: Community structure, composition and dynamics 35
Photopoints 35
Transects 35
Plots 36
Remote sensing 37
Mammals: occurrences and densities 37
Use by horses and large grazers 39
Birds: occurrences, densities, nesting and reproductive success 40
Reptiles, Amphibians, Fish and other organisms: 42
Conservation 44
Education 45
Living Laboratory 46
Ecosystem Linking 50
Something for Everyone 51
APPENDIX I: List of Plant species 54
APPENDIX II: List of Mammal species 79
APPENDIX III: List of Bird species 81
APPENDIX IV: List of Reptile and Amphibian species 84
APPENDIX V: Description of Sugarfoot Fly 88
REFERENCES 89

Preface

Hogtown Creek is a special place deserving of the recognition and respect that the proposed greenway project will afford. Discriminating between land areas on the basis of "environmental sensitivity" can justify unending scientific inquiry, and still the question of what effect human interaction has on the environment will remain unanswered. For most areas along Hogtown Creek, the greenway project will be the best thing that could happen to the creek. Hopefully, this report will guide decisions that will result in a greenway which enhances the understanding and appreciation of the natural world in its human visitors while protecting the diverse and beautiful Hogtown Creek.

HOGTOWN CREEK GREENWAY

Gainesville, Florida



Community Types

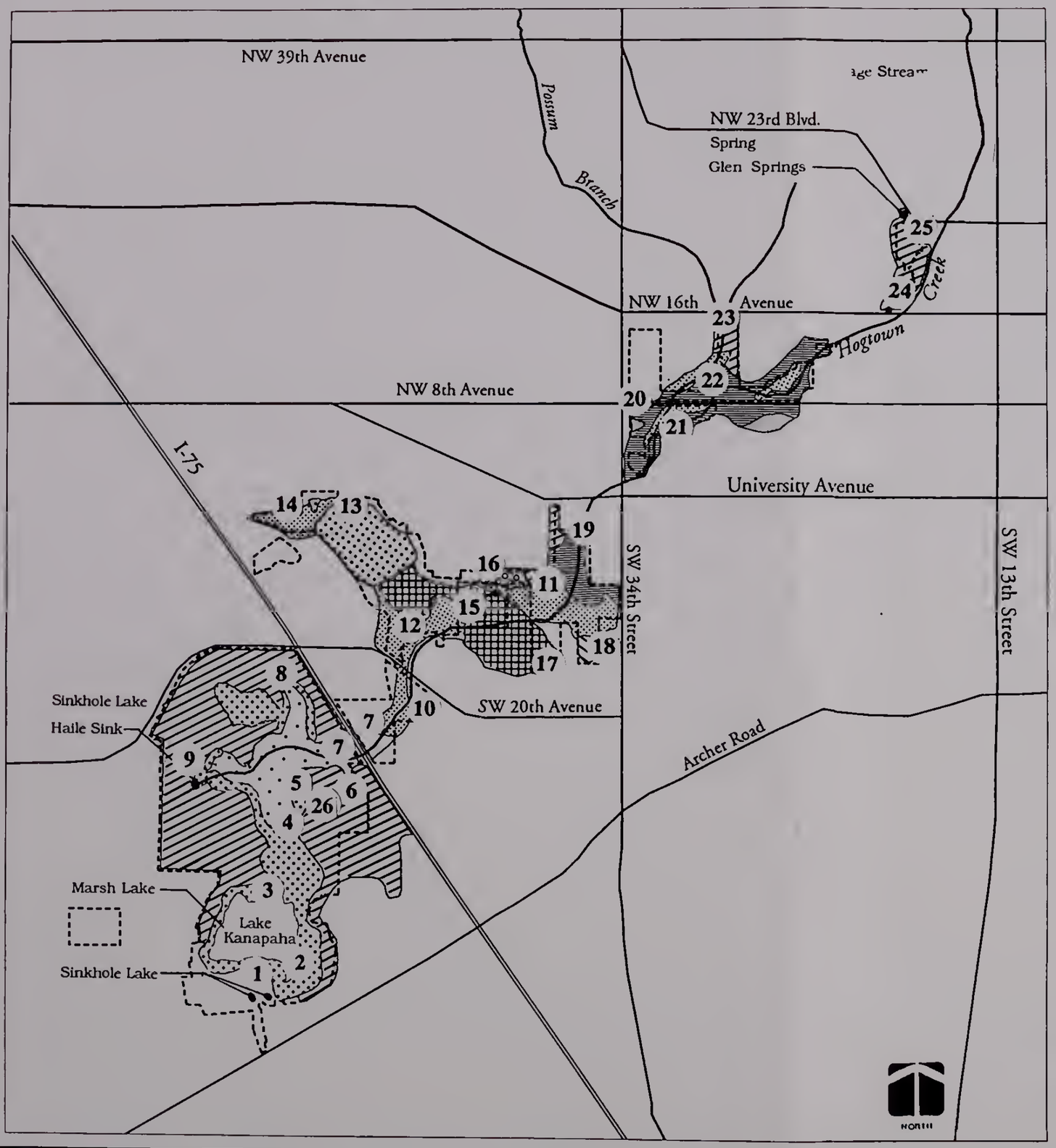
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- Basin Marsh
- Basin Swamp
- Floodplain Forest
- Floodplain Marsh
- Floodplain Swamp
- SEE LEADER — Marsh Lake
- SEE LEADER — Spring
- SEE LEADER — Sinkhole Lake
- SEE LEADER — Seepage Stream
- Upland Mixed Forest
- Xeric Hammock
- Sand Hill
- Developed Areas

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HOGTOWN CREEK GREENWAY

Gainesville, Florida



Ecological Survey Sites and Community Types

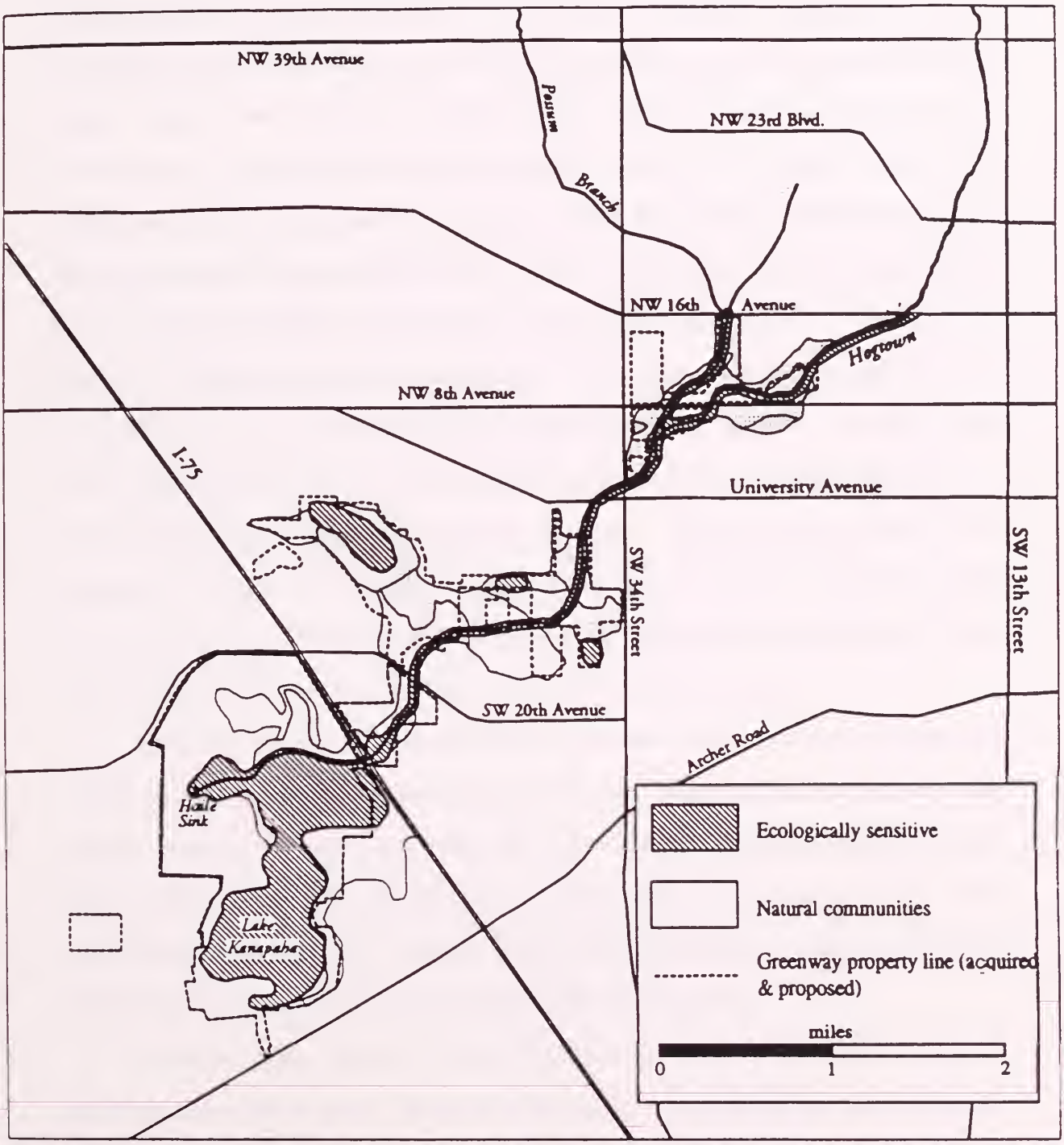
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NOTE:
THE SURVEY SITES INDICATED ABOVE ARE GENERAL LOCATIONS OF LARGER AREAS STUDIED.

ECOLOGICALLY SENSITIVE AREAS
HOGTOWN CREEK GREENWAY
Gainesville, Florida

MAP III



ECOLOGICAL DESCRIPTION OF THE GREENWAY

FLORA OF HOGTOWN CREEK GREENWAY

The Hogtown Creek drainage basin represents a variety of mesic upland, wet flatwoods, floodplain and basin wetlands, lacustrine, riverine, and xeric communities. Recognized community types closely parallel those defined by the Florida Natural Areas Inventory (FNAI) classification system. Many of these habitats are remarkably well represented and despite a long history of human impacts in and around the area, have maintained a high level of ecological integrity. The habitats encountered, though sometimes remarkably distinct, are frequently observed as ecological gradations amongst the more purely described "types". In such cases, an observed habitat will more closely fit two described types more than any single type. In other cases, an observed habitat does not lend itself to any convenient classification. This is as much a natural variation as it is a result of human disturbance and consequent manipulation of land, water and vegetation. This point is particularly important in the present study, where a long history of human occupation of, and interaction with the areas natural resources is evident. Areas that escape specific "type" designation are often some of the most interesting and their presence should be considered a benefit to the area as a whole. Other areas of the Hogtown Creek Greenway are represented by a mosaic of communities, the absolute borders of which were not described in this study.

Descriptions of general types of habitats are important to the processes of design and broad scale management. Comprehensive lists of plant and animal species which occur in the study area are also included. Knowledge of the presence of particular plants and animals will allow decision makers and others to more fully appreciate the innumerable ecotones and microhabitats present in the area. Simple delineation of broad habitats is useful but should not downplay the importance of individual taxonomic and microsite concerns.

The plant list (see appendix I) consists of 530 taxa, of which 468 are identified to species and 62 are known only to genus. Seventeen of the species we encountered are state or federally listed or proposed for listing as species of special concern, threatened or endangered. Many more of the species are considered rare or uncommon. Others are of local significance. Several species

were encountered that had not previously been documented from Alachua County and thus, a range extension was established. At least 55 species of exotic plants were identified (see Table I and Appendix I), although we are certain that there are many more. This is the most complete plant species list for the Hogtown Creek area to date. Nonetheless, we anticipate that the list is not complete and will, with time and diligence, be expanded to include perhaps an additional 100-200 species.

Table I. EXOTIC PLANT SPECIES OBSERVED AT SPECIFIC SITES

Site*	Species
1	*Eichornia crassipes*
2	*Lygodium japonicum, Oplismenus setarius, Broussenetia paperifera*
3	*Eichornia crassipes*
4	*Eichornia crassipes*
7	*Oplismenus setarius*
11	*Tradescantia fluminensis, Lonicera japonica, Ardisia crenata, Nasturtium officinale, Oxalys corymbosa*
14	*Youngia japonica*
18	*Eremochloa ophiuroides*
19	*Ligustrum japonicum, Youngia japonica*
21	*Tradescantia fluminensis, Oxalis* sp.
22	*Ligustrum* sp., *Tradescantia fluminensis, Elaeagnus pungens*
23	*Tradescantia fluminensis, Ardisia crenulata, Youngia japonica*
25	*Ardisia crenata , Hedera helix, Xanthosoma sagittifolium,*

*site refers to numbered ecological survey sites (see Map I).

There are many other elements of the Hogtown Creek Greenway we encountered that did not stand distinctly in the treatment by flora and fauna. These elements are classified simply as Keynote Features of the Hogtown Creek Greenway system and are summarized in the following table.

Site	Keynote Species or Features
1	Species in this wetland area include water shrew, marsh rat; osprey, ducks, coots and many migratory bird species.
2	Remarkably large sabal palms and live oaks
3	Population of aquatic plant, *Nuphar lutea;* birds include Terns, Great Blue Herons, galinule, coots. Other animals include alligators and gar fish (some over 2ft long)
4	Species include abundant nesting Osprey
5	Area contains unique limestone fault line in Mesic Hammock bordering remnant Sand Hill habitat.
6	Area is remnant Sand Hill, an ecological succession to hammock. Species include Gopher Tortoise and one of the tortoises favorite foods, the cactus *Opuntia humifusa*
7	Large individuals of Gum and Elm trees and perhaps the best seasonal population of *Lobelia cardinalis* occur where the creek becomes highly dissected.
9	Species include remarkably large examples of red bay tree, *Persea barbonia*
11	Species include *Carex intumescens*, *Bumelia reclinata var. reclinata*, *Arundinaria gigantea*, *Aesculus pavia*, *Hymenocallis rotata*
12	Area of rolling topography, dry hammock grading down to more swampy conditions near the creek
15	Most dense concentration of poison ivy observed. Occurring in the ecotone, Paw Paw (*Asimina parviflora)*
16	*Gaylussachia* sp. and other species of Xeric Hammock are well represented. The XH is considered the climax community, originally a Scrub area, fire has been excluded here for many years
17	Extensive Osprey habitat. Plant species include; *Spiranthes cernua*, *Epidendrum conopsium* (both orchids), *Arisaema triphyllum*, large *Quercus virginiana*
18	This "pine island" or isolated Sand Hill habitat is unique in the greenway Area, and is perhaps one of the most fragile. It is presently home to a very dense population of Gopher Tortoise which have lately been heavily predated (dug up and killed) by dogs.
19	Species incl: *Trillium recurvata*, *Arundinaria gigantea*, *Aesculus pavia*, *Arisaema triloba*, *Sabal minor*; and very large specimens of *Planera aquatica* (Water Elm)
20	Marsh is dominated by *Zizaniopsis milliacea* (wild rice)
21	Species include *Aesculus pavia*, *Spiranthes cernua* (orchid), *Acer floridana*, *Forestiera* (native privet), *Crataegus uniflora*, *Arundinaria gigantea*, *Zizaniopsis milliacea* (wild rice)
22	Species include swamp chestnut oak; *Arisaema triphyllum*. Spruce Pine (*Pinus glabra)*; clubtail dragonfly (indicator species for water quality)
24	Ring Park species include native Rhododendron, Haw, Bumelia and numerous other planted natives.
25	Species include the Needle Palm (*Rhaphidophyllum histrix)*, Hornwort (*Phaeoceros* sp.*)*, Jack-in-the-pulpit (*Arisaema triphyllum)*
26	Pair of Bald Eagles nesting just northeast of dike area. Nest is in one of only two tall pine trees available.

Natural Community Types

(See Map II)

Hogtown Creek itself represents elements of three unique riverine communities: Spring-run Stream, Seepage Stream and Blackwater Stream. While the Creek originates north of Gainesville in the Buck Bay and Potato Patch Bay areas, the upstream portion of Hogtown Creek in the greenway, receives year-round flow from Glen Springs at 23rd Avenue and Seepage along the stream banks from south of 39th Avenue. And while the stream waters are typically clear coming from springs and seepage, in some areas, at high flow rates, the water is perceptibly blackened owing to the high level of tannins present from decomposing needles and leaves. Each of these elements is further enhanced by physical characteristics of the creek including massive flow rate changes, the streams passage through and maintenance of Floodplain Forest, Bottomland Forest, Floodplain Swamp, Basin Swamp, Basin Marsh and Marsh Lake.

Mid valley areas of Hogtown Creek are subject to sheet-flow during periods of storm runoff. After reaching base level, streams shift their positions in their wide valleys with each flood water event. Former channels are abandoned and the character of the stream takes on a braided appearance. Following flood events, former channels remain filled with standing water, a condition that not only contributes to occasional increases in the "blackwater" color, but also promotes the breeding of amphibians and insects, particularly mosquitoes.

The following plant species were observed along the stream corridor.

Canopy: *Liquidambar styraciflua* (Sweetgum), *Magnolia virginiana* (Sweetbay), *Ostrya virginiana* (Hophornbeam; Ironwood), *Tilia caroliniana* (Basswood)

Understory: *Ardisia crenata* (Coral Ardisia), *Cornus foemina* (Stiff Dogwood), *Decumaria barbara* (Climbing hydrangea), *Hedera helix* (English Ivy), *Sabal palmetto* (Cabbage Palm), *Sambucus canadensis* (Elderberry)

Herbaceous layer: *Galium aparine*, *Loriope spicata*, *Oxalis* sp., *Thelypteris kunthii* (Wood Fern), *Xanthosoma sagittifolium* (Elephant Ear)

Spring-run Stream

Springs are abundant in North Central Florida and contribute unique aspects to the region's hydrology. Springs are derived from artesian openings in the underground aquifer and their waters are saturated with important minerals and maintain a constant temperature, thus contributing significantly to the stability of downstream areas for plant and animal life.

Seepage Stream

Seepage refers to the perennial or intermittent seasonal water courses that originate from shallow ground waters that have percolated through deep, sandy, upland soils. Seepage streams occur only in areas of marked topography. The percolation of water through the ground provides a natural filter, releasing water that is clean and of fairly constant temperature. The steep banks of Hogtown Creek between 16th and 39th Avenues are excellent examples of seepage. These areas are probably home to numerous insect species unique to seepage areas and unique to this area of Florida.

Blackwater Stream

These streams are characterized by their tea-colored waters due to high tannin and iron levels. Typically, blackwater streams result from large wetland areas with organic soils. These areas act as reservoirs. They hold water and release it slowly into the stream. Hogtown Creek's blackwaters are probably the result of swampy areas north of the greenway isolated by changing water levels, holding large pools of water which are released into the creek during high water periods.

Upland Mixed Forest

This habitat type dominates forested areas in the northern portion of the greenways area, flanking Hogtown Creek from 39th Avenue to 16th Avenue. It occurs in several smaller pockets south of 16th Avenue and around Creekside Mall and Green Acres Park, although each of these

sites varies considerably and represent unique habitats. This forest type also dominates the uncleared lands around Kanapaha basin. The more typical Upland Mixed Forest of the north is characterized as well developed, closed-canopy forests of upland hardwoods on rolling hills with limestone near the surface and occasionally as outcrops. Wet ground and a closed canopy maintain a natural fire exclusion condition. Upland Mixed Forest habitats have been reduced dramatically due to residential and silvicultural developments. Much of the forests contained in the greenway seem to be increasingly invaded by exotic plants, a cause for serious concern if the ecological integrity is to be preserved.

Plant Species Observed

Canopy: *Acer negundo* (Boxelder), *Acer rubrum* (Red Maple), *Broussonitia papyrifera* (Japanese Paper Mulberry), *Carya aquatica* (Water Hickory), *Carya glabra* (Pignut Hickory), *Celtis laevigata* (Sugarberry), *Cornus florida* (Flowering Dogwood), *Fraxinus americana* (White Ash), *Fraxinus pennsylvanica* (Green Ash), *Liquidambar styraciflua* (Sweetgum), *Magnolia grandiflora* (Bull Bay), *Persea borbonia* (Red Bay), *Pinus elliotii* (Slash Pine), *Pinus taeda* (Loblolly Pine), *Quercus hemisphaerica* (Laurel Oak), *Quercus nigra* (Water Oak), *Quercus virginiana* (Live Oak), *Sabal palmetto* (Cabbage Palm), *Vitis rotundifolia* (Scuppernong, muscadine)

Understory: *Acer negundo* (Boxelder), *Aesculus pavia* (Red Buckeye), *Aralia spinosa* (Devil's Walking Stick), *Bumelia anomala*, *Carpinus caroliniana* (Blue Beech, Mussle Wood), *Cephalanthus occidentalis* (Button Bush), *Cornus florida* (Flowering Dogwood), *Crataegus* sp. (Hawthorne), *Crataegus uniflora* (One-flowered Haw), *Crysobalanus icaco*, *Euonymous americanus* (Hearts a' Bustin), *Gaylussacia tomentosa* (Dangleberry), *Hypericum* sp. (St. John's Wort), *Ilex opaca* (American Holly), *Itea virginica* (Virginia-Willow), *Juniperus silicicola* (Southern Red Cedar), *Liquidambar styraciflua* (Sweetgum), *Myrica cerifera* (Wax Myrtle), *Ostrya virginiana* (Hophornbeam; Ironwood), *Planera aquatica* (Water Elm), *Prunus caroliniana* (Cherry-laurel), *Quercus michauxii* (Swamp Chestnut Oak), *Quercus nigra* (Water Oak), *Sabal minor* (Little Blue-stem Palm), *Sabal palmetto* (Cabbage Palm), *Sambucus canadensis* (Elderberry), *Tilia caroliniana* (Basswood), *Toxicodendron radicans* (Poison Ivy), *Ulmus alata* (Winged Elm), *Vitis rotundifolia* (Scuppernong, muscadine)

Herbaceous layer: *Ampeloposis arborea* (Peppervine), *Arisaema triphyllum* (Jack-in-the-pulpit), *Carex* sp., *Chaerophyllum tainturieri*, *Circium horridulum* (Thistle), *Elaeagnus canadensis*, *Eupatorium capillifolium* (Dog Fennel), *Gelsemium sempervirens* (Yellow Jessamine), *Hedyotis uniflora* (Fairy Footprints), *Juncus effusus* (Soft Rush), *Linaria canadensis*, *Magnolia grandiflora* (Bull Bay), *Mitchella repens* (Partridge Berry), *Opuntia humifusa* (Prickly Pear), *Osmunda cinnamomea* (Cinnamon Fern), Oxalis sp., *Parthenocissus quinquifolia* (Virginia Creeper), *Polypodium polypodiodes* (Resurrection Fern), *Rubus argutus* (Highbrush), *Sanicula canadensis* (Black Snakeroot), *Smilax auriculata* (Green Briar), *Smilax bona-nox* (Green Briar), *Smilax pumila* (Sarsparilla Vine), *Smilax* sp., *Stachys floridana* (Hedge Nettle, Florida Betony), *Thelypteris kunthii* (Wood Fern), *Toxicodendron radicans* (Poison Ivy), *Tradescantia fluminensis* (Wandering Jew), *Viola* sp. (violet), *Vitis aestivalis* (Summer Grape), *Woodwardia areolata* (Netted Chain Fern), *Woodwardia virginica* (Virginia Chain Fern)

Bottomland Forest

Occurs south of NW 16th Avenue in large patches frequently grading into areas of Floodplain Forest and other, wetter habitats. Bottomland Forests are characterized by their low-lying, closed canopy of tall, straight trees with either a dense shrubby understory and little ground cover, or an open understory and ground cover of ferns, herbs, and grasses. While typical bottomlands are subject to only annual or semi-annual flood events, the Hogtown Creek bottomlands are more frequently flooded. In addition, the volume of drainage passing through the creek has probably been increasing steadily since the onset of major urban developments along its perimeter. Consequently, it is likely that species diversity has been reduced and levels of exotics increased. Upland species are typical of most bottomland forests, but are of fairly low importance in the bottomlands of Hogtown Creek. Sheet-flow is common in the these forests and has created a highly dynamic, braided stream course throughout the area.

Plant Species Observed

Canopy: *Acer negundo* (Boxelder), *Acer rubrum* (Red Maple), *Celtis laevigata* (Sugarberry), *Liquidambar styraciflua* (Sweetgum), *Nyssa sylvatica* var. *biflora* (Sour Gum), *Pinus elliotii* (Slash Pine), *Pinus taeda* (Loblolly Pine), *Quercus laurifolia* (Diamond-leaf Oak, Laurel Oak), *Quercus nigra* (Water Oak), *Quercus virginiana* (Live Oak), *Salix caroliniana* (Coastal Plain Willow)

Understory: *Aesculus pavia* (Red Buckeye), *Bidens pilosa* (Beggar Ticks), *Cephalanthus occidentalis* (Button Bush), *Euonymous americanus* (Hearts a' Bustin), *Sambucus canadensis* (Elderberry), *Toxicodendron radicans* (Poison Ivy), *Ulmus americana* (American Elm)

Herbaceous layer: *Cyperus* sp., *Hydrocotyle umbellata* (Marsh Pennywort), *Mitchella repens* (Partridge Berry), *Osmunda cinnamomea* (Cinnamon Fern), *Osmunda regalis* (Royal Fern), *Oxalis* sp., *Rumex crispus*, *Salvinia minima* (Water Spangles), *Saururus cernuus* (Lizard's Tail), *Scirpus* sp., *Spirodela punctata* (Duckweed), *Toxicodendron radicans* (Poison Ivy), *Tradescantia fluminensis* (Wandering Jew), *Typha latifolia* (Common Cattail), *Wolffiella gladiata*, *Woodwardia areolata* (Netted Chain Fern)

Floodplain Forest

These forests overlap with Bottomland Forests throughout the Hogtown Creek floodplain. In the southern portion of the creek system, they grade into Floodplain Swamp. Hydroperiod is the principal defining character of this forest type. These forests are flooded for up to half of the

growing season. They are usually without standing water during the dry season, but seasonal flooding in the summer is critical to their health as well as the communities downstream. Species composition of this community could be severely impacted by changes in the levels and course of the creek.

Plant Species Observed

Canopy: *Acer rubrum* (Red Maple), *Carpinus caroliniana* (Blue Beech, Mussle Wood), *Celtis laevigata* (Sugarberry), *Liquidambar styraciflua* (Sweetgum), *Ostrya virginiana* (Hophornbeam; Ironwood), *Pinus elliotii* (Slash Pine), *Planera aquatica* (Water Elm), *Quercus laurifolia* (Diamond-leaf Oak, Laurel Oak), *Quercus michauxii* (Swamp Chestnut Oak), *Quercus nigra* (Water Oak), *Quercus virginiana* (Live Oak), *Salix caroliniana* (Coastal Plain Willow), *Tilia caroliniana* (Basswood), *Ulmus alata* (Winged Elm)

Understory: *Aesculus pavia* (Red Buckeye), *Arundinaria gigantea* (Giant Cane), *Asplenium platyneuron* (Ebony Spleenwort), *Carex* sp., *Carpinus caroliniana* (Blue Beech, Mussle Wood), *Cornus foemina* (Stiff Dogwood), *Crataegus uniflora* (One-flowered Haw), *Eleocharis* sp., *Euonymous americanus* (Hearts a' Bustin), *Galium aparine*, *Hypericum hypericoides* (St. Andrews Wort), *Juncus* sp. (Rush), *Juniperus silicicola* (Southern Red Cedar), *Magnolia grandiflora* (Bull Bay), *Planera aquatica* (Water Elm), *Prunus caroliniana* (Cherry-laurel), *Rubus argutus* (Highbrush), *Sabal minor* (Little Blue-stem Palm), *Sambucus canadensis* (Elderberry), *Ulmus alata* (Winged Elm), *Viola* sp. (violet)

Herbaceous layer: *Asplenium platyneuron* (Ebony Spleenwort), *Galium aparine*, *Oxalis corymbosa* (Violet Wood Sorrel), *Oxalis* sp., *Parthenocissus quinquifolia* (Virginia Creeper), *Rubus argutus* (Highbrush), *Rumex crispus*, *Saururus cernuus* (Lizard's Tail), *Toxicodendron radicans* (Poison Ivy), *Tradescantia fluminensis* (Wandering Jew), *Viola* sp. (violet), *Youngia japonica*

Floodplain Marsh

At least two pockets of Floodplain Marsh were identified, both are associated with the Floodplain Forest south of NW 8th Avenue and one of the sites is just outside of the greenway. The habitat is characterized by herbaceous vegetation (typically grasses and sedges) with some small shrubs. According to FNAI, these areas experience regular and frequent inundation (250 days per year), as well as occasional low intensity burns (every 1-5 years). These conditions keep invasive shrubs and trees from expanding into the marsh and, eventually excluding the grasses. This area may be too close to private homes to burn.

Floodplain Swamp

An extensive area of Floodplain Swamp extends from the southern edge of Sugarfoot Prairie to just west of SW 34th Street. The abundance of buttressed trees and high lichen lines in this habitat attest to the high frequency of flooded conditions. Many small areas within this habitat hold isolated ponds of floodwaters for long periods of time, releasing them only as floodwaters return and flush them out. This re-release of leaf litter steeped water is partly responsible for the blackwater aspect of the creek. These isolated ponds are also critical for the reproductive cycle of many amphibians as well as a host of invertebrates, including mosquitoes.

Plant Species Observed

Canopy: *Acer rubrum* (Red Maple), *Fraxinus pennsylvanica* (Green Ash), *Liquidambar styraciflua* (Sweetgum), *Nyssa sylvatica* var. *biflora* (Sour Gum), *Quercus laurifolia* (Diamond-leaf Oak, Laurel Oak), *Quercus nigra* (Water Oak), *Ulmus alata* (Winged Elm), *Ulmus americana* (American Elm)

Understory: *Cephalanthus occidentalis* (Button Bush), *Itea virginica* (Virginia-Willow), *Lyonia ferruginea* (Rusty Lyonia), *Myrica cerifera* (Wax Myrtle), *Sambucus canadensis* (Elderberry), *Toxicodendron radicans* (Poison Ivy), *Vaccinium corymbosum* (Highbush blueberry)

Herbaceous layer: *Carex* sp., *Hydrocotyle* sp., *Osmunda cinnamomea* (Cinnamon Fern), *Osmunda regalis* (Royal Fern), *Thelypteris kunthii* (Wood Fern), *Toxicodendron radicans* (Poison Ivy), *Woodwardia areolata* (Netted Chain Fern), *Woodwardia virginica* (Virginia Chain Fern)

Basin Marsh

Also called Wet Prairie, Basin Marsh habitat dominates the Sugarfoot Prairie area of the greenway system and extends to and surrounds Lake Kanapaha to the south. The area probably developed in a solution depression and is fire and hydroperiod maintained. Flooding at least 200 days per year and burning every 1-10 years has probably kept this areas from more serious encroachment by other, more arboreal species.

Plant Species Observed

Canopy: *Acer rubrum* (Red Maple), *Itea virginica* (Virginia-Willow), *Phoradendron serotinum* (Mistletoe), *Planera aquatica* (Water Elm), *Quercus laurifolia* (Diamond-leaf Oak, Laurel Oak), *Salix caroliniana* (Coastal Plain Willow)

Understory: *Baccharis halimifolia* (Saltbush), *Berchemia scandens* (Rattan Vine), *Celtis laevigata* (Sugarberry), *Cephalanthus occidentalis* (Button Bush), *Cornus florida* (Flowering Dogwood), *Hypericum* sp. (St. John's Wort), *Ludwigia peruviana* (Primrose Willow), *Myrica cerifera* (Wax Myrtle), *Rosa palustris* (Swamp Rose), *Salix caroliniana* (Coastal Plain Willow), *Typha* sp., *Ulmus americana* (American Elm), *Vitis* sp.

Herbaceous layer: *Rumex verticilata*, *Carex* sp., *Centella asiatica*, *Dulichium arundinaceum* (Three-way Sedge), *Galium* sp., *Hydrocotyle ranunculoides* (Pennywort), *Hydrocotyle* sp., *Juncus* sp. (Rush), Lemna minor, *Osmunda regalis* (Royal Fern), *Panicum hemitomon* (Maidencane), *Polygonum pensylvanicum* (Knotweed), *Rubus argutus* (Highbrush), *Sagittaria latifolia* (Common Arrowhead), *Saururus cernuus* (Lizard's Tail), *Scirpus* sp., *Sisyrinchium rosulatum*, *Smilax auriculata* (Green Briar), *Typha* sp., *Woodwardia areolata* (Netted Chain Fern)

Basin Swamp

Beginning just east of I-75 and continuing west at the lower portion of the greenway system, Bottomland Forest grades into Basin Swamp, and Hogtown Creek becomes highly divided, even in times of very dry weather. To the north, the habitat is known as Sugarfoot Hammock, to the south, Lake Kanapaha. It is characterized by periodic dry periods and probably burns occasionally. Hydroperiods are critical, as in other wetland communities, for maintaining species diversity and preventing catastrophic fires. Sugarfoot Hammock is home to the extremely rare and locally endemic Sugarfoot Fly (*Nemopalpus nearcticus*) (see appendix V).

Plant Species Observed

Canopy: *Acer rubrum* (Red Maple), *Celtis laevigata* (Sugarberry), *Fraxinus* sp., *Nyssa sylvatica* var. *biflora* (Sour Gum), *Planera aquatica* (Water Elm), *Quercus nigra* (Water Oak)

Understory: *Cephalanthus occidentalis* (Button Bush), *Liquidambar styraciflua* (Sweetgum), *Myrica cerifera* (Wax Myrtle)

Herbaceous layer: *Ampeloposis arborea* (Peppervine), *Berchemia scandens* (Rattan Vine), *Campsis radicans* (Trumpet Vine), *Smilax* sp., *Toxicodendron radicans* (Poison Ivy), *Vitis* sp., *Wisteria* sp. (Wisteria)

Marsh Lake

Lake Kanapaha is a large shallow depression lake surrounded by bands of aquatic vegetation but open in the middle. Lake water is derived mostly from runoff from the surrounding uplands, and the lake functions as an aquifer recharge source in times of drought (FNAI).

However, water level in the lake can fluctuate in response to groundwater levels and water volume in the Creek. Even though water levels change significantly in the lake, it is permanent home to many species including, turtles, alligators, amphibians, fish, birds, mammals and aquatic plants. The shallow edge, with variably flooded marshland is important wading bird and fish breeding habitat.

Plant Species Observed

Canopy: *Sabal palmetto* (Cabbage Palm)

Understory: *Amaranthus australis*, *Andropogon* sp., *Scirpus* sp., *Typha latifolia* (Common Cattail)

Herbaceous layer: *Brasaenia shreberi*, *Ceratophyllum demersum*, *Hydrocotyle* sp., *Limnobium spongium*, *Nuphar luteum* (Spatter-Dock), *Polygonum* sp., *Pontederia cordata*, *Sagittaria latifolia* (Common Arrowhead), *Salvinia minima* (Water Spangles), *Spirodela punctata* (Duckweed)

Sinkhole Lake

These deep, inverted cone-shaped depressions occur on limestone bases, where subsurface solution erosion reduces the above limestone layer beyond where it can support the ground above it, collapses and fills with either runoff water, or groundwater. This habitat is considered endangered in Florida and should be protected from erosion-causing over use by hikers and bikers. There are two sinkhole lakes at the south end of Lake Kanapaha.

Xeric Hammock

An isolated area of this unique habitat occurs in Green Acres Park, where it abuts Floodplain Swamp with almost no ecotone transition. This habitat is an artifact of more extensive Sandhill areas of the ancient past and is becoming increasingly rare because of its suitability for development.

Plant Species Observed

Canopy: *Pinus taeda* (Loblolly Pine), *Quercus geminata* (Sand-live Oak), *Quercus hemisphaerica* (Laurel Oak), *Quercus nigra* (Water Oak)

Understory: *Gaylussacia alba*, *Gaylussacia nana* (Dangleberry), *Quercus hemisphaerica* (Laurel Oak), *Serenoa repens* (Saw Palmetto), *Vaccinium arboreum* (Sparkleberry)

Herbaceous layer: *Rhyncosia* sp., *Smilax auriculata* (Green Briar), *Smilax bona-nox* (Green Briar), *Smilax pumila* (Sarsparilla Vine), *Vaccinium darowii*

Sandhill

Characterized by open sand, on rolling hills with longleaf pine, wiregrass and gopher tortoises, this area is very rare within the City limits. Fire is a dominant ecological factor in this community type. Frequent fires (every 2-5yrs.) help to maintain this habitat and the plants within it. Gopher tortois holes are abundant in this area. The area is extremely fragile and should it be included in the greenway trail system, it must be protected from uncontrolled pedestrian traffic.

Plant Species Observed

Canopy: *Pinus clausa* (Sand Pine), *Pinus palustris* (Longleaf Pine), *Quercus geminata* (Sand-live Oak), *Quercus hemisphaerica* (Laurel Oak), *Quercus laevis* (Turkey Oak)

Understory: *Asimina angustifolia* (Narrowleaf Pawpaw), *Crataegus flava* (Summer Haw)

Herbaceous layer: *Aristida stricta* (Wiregrass), *Balduina angustifolia*, *Berlandiera subacaulis*, *Bulbostylis* sp., *Centella asiatica*, *Cladina* sp., *Cladonia* sp., *Crotalaria rotundifolia* (Rabbit-Bells), *Dalea* sp., *Eriogonum tomentosum* (Wild Buckwheat), *Eupatorium capillifolium* (Dog Fennel), *Gaylussacia alba*, *Geastrum* sp., *Hypericum* sp. (St. John's Wort), *Lechia* sp., *Licania michauxii*, *Opuntia humifusa* (Prickly Pear), *Pityopsis graminifolia*, *Polygonella gracilis* (Wireweed), *Quercus incana* (Bluejack Oak), *Rhus copallina* (Winged Sumac), *Rhyncosia* sp.

FAUNA OF THE HOGTOWN CREEK GREENWAY

The list of fauna generated from fieldwork, personal communication and literature review are summarized in the tables in Appendices II, III and IV. It should be noted that these lists cannot include all transient species that may occasionally pass through this corridor-like aquatic ecosystem. To evaluate which of these species are resident, breeding, or transient in the greenway area at a given time will require regular monitoring. Since there has been no previous monitoring to form a basis of comparison, this is a crucial element if changes to the ecosystem are to be detected. This type of work is extremely costly and, unless conducted on a fairly broad and intensive basis, relatively meaningless. Some of the species occurring in the greenway are "listed"

(considered rare, endangered, or of special interest) by either state or federal agencies, and some monies are available for research of these species. Some of these species are shown in table III.

Mammals

Numerous small rodents and insectivores are common in each of the habitats encountered along the greenway. Other, larger mammals such as armadillos and opossums are fairly common, while spotted skunks, striped skunks, and gray and red foxes are infrequent but known visitors to the area. We have three species of rabbit but they are only common in open grassy areas, such as the grassy fringes of Lake Kanapaha, not closed riverside habitats. At least three species of bats are important residents all along the greenway, consuming 1/3 their weight in insects each night.

Coyotes (*Canis latrans*) are increasing in the rural areas surrounding Gainesville so the possibility exists of their passing through the greenway. Red and grey foxes have been increasing in Gainesville the last few years, and the greenway could help keep them out of urban areas. River otters (*Lutra canadensis*) were reported in the creek within the last decade. Raccoons (*Procyon lotor)* are presently very common along Hogtown Creek (without systematic sampling, we can still state this simply by track frequency). Although they occasionally carry rabies, their nocturnal and shy habits preclude problems with humans, except that unvaccinated dogs are at risk. Dogs will use the greenway as a hunting ground if allowed free access, and could pose a serious threat to mammals and fragile habitats. While larger mammals such as deer, bear, and panther are potential visitors to the greenway, they will not use the corridor unless extensive expansion of natural areas beyond human habitation are added, e.g. connection to the San Felasco Hammock area and to Paynes Prairie. Although the benefits of "corridor theory" (Noss & Harris 1986) to mammals is disputed, the occasional presence of larger mammals on the greenway will depend on future expansion and will be indicative of a linear park functioning as a corridor.

Birds

Due to the varied community types found in the greenway, the site supports a diverse group of wintering migratory and breeding songbirds (passerines) and birds of prey (raptors). In addition, Lake Kanapaha and its surroundings provide excellent year round habitat for a variety of waterfowl, wading birds and raptors. Over 100 species were identified during preliminary field survey and research. This should be considered the "short list" of birds for the area (it is likely that local bird enthusiasts have developed far more complete lists, such as Audobon's Christmas counts, which will help round out the record for the greenway). Among the more significant finds are a pair of nesting bald eagles, occasional wood storks and the loggerhead shrike, a species which is declining throughout its range. Given the extensive conversion of forested and wetland habitats to agriculture and residential land use in areas adjacent to the greenway, this area should be considered critical to the continued viability of populations of many of these bird species.

Many migrant songbirds currently breed and nest in the mixed and bottomland hardwoods. The selection of this site for nesting is probably explained, at least in part, by the absence of human visitors to the area. The lack of human disturbance is probably also a factor in the high incidence of nesting in the larger interior woodland zones such as the Sugarfoot Prairie and Sugarfoot Hammock areas. The riparian woodlands are important for insectivorous birds such as swallows, robins, thrushes, and warblers, while the prairie and lake areas are critical for raptors dependent on small mammals, lizards, snakes and frogs. This area is close enough to the nesting habitats of Paynes Prairie so that the open prairie species such as bitterns and meadowlarks utilize the area.

Songbirds often increase in species diversity with increasing suburban development. This effect is largely due to an increase in the variety of microhabitats (exotic fruiting and flowering ornamental plants) and frequently provided feeders and water sources. In some cases, native bird species can be reduced due to the success of other species. One goal of the greenway should be to minimize this effect by preserving contiguous natural forest, where native passerines will be less

threatened by crowding (Stouffer & Best 1980). Studies are ongoing as to the minimum critical size of habitat fragments for each species.

Reptiles, Amphibians and Fish

The herpetofauna of headwater areas in the Hogtown Creek basin probably includes stream-side salamanders, e.g., *Desmognathus auriculatus, Plethodon grobmani,* and *Pseudotriton montanus*. There is a chance that certain upland and flatwood species (e.g., *Gopherus polyphemus, Drymarchon corias, Crotalis adamanteus,* ratsnakes, *Podomys floridanus*, etc.,) intrude into these narrow valleys from adjoining habitats but again, systematic sampling would be necessary to detect them. There is nothing unique about mid-valley amphibian and reptile faunas. The herpetofauna includes species that are adapted to variable water levels (e.g., various frogs, *Terrapene carolina, Eumeces inexpectatus, Eumeces laticeps, Ophisaurus ventralis*, etc.,). In mid-stream areas, i.e., NW 8th Avenue, impoundment of water by road embankments on the up-stream side of the road impacts vegetative cover and probably disrupts terrestrial and wetlands invertebrates, and to a lesser extent vertebrates.

Herpetological communities in the Kanapaha basin include typical aquatics such as *Siren, Pseudobranchus, Amphiuma, Alligator, Pseudemys, Nerodia*, and probably various water snakes. Unusual herpetological species from this area include the rusty mud salamander (*Pseudotriton montanus floridanus*). Described by Goin and Netting (1942, Ann. Carnegie Mus., 29:175-196), this salamander was initially collected in the Hogtown creek basin. The type locality was listed as, C Creek, on University of Florida campus, and recorded paratypes from "Hogtown Creek". Two of the species we list as potentially occurring in the creek (*Rana capito* and *Notophthalmus perstriatus*) are proposed for federal listing as Threatened species and are currently under review. Although not previously collected in the greenway area, they could use ephemeral pools in the Kanapaha basin.

The gopher tortoise is a "species of special concern" in Florida. It is declining in Gainesville due to habitat loss and a respiratory bacterial disease that is reaching epidemic

proportions locally. Active gopher tortoise colonies exist west of the university's Behavior Research Lab and in small sandy upland patches around Sugarfoot Prairie and northeast of Lake Kanapaha. Over 20 burrows were located at the Behavior Lab site alone. This area is rather isolated and does not provide a natural escape route should conditions change. If their burrow locations cannot be protected, therefore, translocation to other suitable sandhill sites is suggested. A minimum of 50' from any known burrow must be protected from all disturbance.

The fish fauna includes perhaps 16 native species and an undetermined number of exotics. *Notropis chalybaeus* is the only representative of a traditional stream fauna; the rest of the fishes are typical of ponds, lakes, and sluggish streams. Dissolved oxygen levels are critical to native fish communities, which in turn support raccoons, ospreys, eagles, and potentially, otters. Minimum oxygen requirements of fish must be maintained throughout the hottest periods of the year, by maintaining sufficient flow-rates. We are reminded of the physics of gases in water: increasing temperature decreases the volume of gas held. Hence, both temperature and flowrate influence dissolved oxygen. Native species have less tolerance to low oxygen levels than some exotic fish such as *Tilapia*. No complete fish survey has been performed, but one is suggested as essential baseline information. The public is usually eager to assist in regular sampling of local fish communities. With check stations accessible, their catches could be useful long-term data.

Crustaceans, Mollusks and Insects

Common crayfish (*Procambarus paeninsulanus*) were observed in Glen Springs, and in racoon feces at other locations. An unusual crayfish occurrence (*Procambarus talpoides)* was reported in the late 1930's from a stream-side seepage area in the upper portion of Hogtown Creek. Other than this observation, the known range of the species is considerably north of Gainesville. The Hogtown population represents the most southern known site of occurrence. The presence of this unusual crustacean should be confirmed and the extent of the more common species should be evaluated for the greenway.

Numerous native species of clams and snails (*Elliptio, Elimia, Campeloma, Viviparia, Pomacea*, etc.) as well as exotics (*Corbicula, Tareba, Melanoides*) have been recorded from Hogtown Creek, but unfortunately their status is undetermined at this time. It seems that this would be an excellent study to see what does still exist.

No comprehensive inventory of invertebrates exists for the Hogtown Creek or adjacent areas. Noteworthy species include the gomphiid dragonfly (*Progomphus obscurus*), the nymph of which is an extensive stream bank burrowing species and a good indicator of water quality -- while it can tolerate moderate levels of pollution, it is quite common and therefore easily monitored. Some stream damselfly nymphs (*Calopteryx maculata*) are also good water quality indicators. The latter species was observed extensively on the creek bottom in the 8th Avenue bottomlands.

Perhaps the best known insect species of the greenway region is Say's Spiketail (*Cordulegaster sayi*), a large species of dragonfly that occurs in adjacent Possum Branch and has attracted the attention of entomologists from around the world (Bill Maufrey, pers. comm.). According to Mr. Maufrey, Manager of the International Odonata Research Institute, it is very likely that the Possum Branch population (which happens to be the largest known in the world) is not the only one in the area and that the seepage dependent species may occur in the greenway seepage area north and south of Glen Springs. The species is currently a candidate for listing by the Florida Game and Fresh Water Fish Commission (FGFWFC) and is considered vulnerable.

Also according to Mr. Maufrey, there are two additional species who's occurrence is confirmed in the greenway and which are also dependent on seepage areas and are very rare. The Gray Petaltail (*Tachopteryx thoreyi*) and Furtive Forktail (*Ischnura prognatha*), two species of damselfly, have been seen in the Glen Springs seepage area. The Gray Petaltail is of particular interest because of its rarity, size and peculiar behavior. It is one of only three species in its genus (*Tachopteryx*) in the world (the others occuring in the pacific northwest and Japan) and has a wingspan of up to 6 inches. It is the only genus of dragonfly in which all the species land vertically on trees. It is common for the dragonfly to land on human visitors to their habitat mistaking them for trees.

Probably the best locally known (and least frequently encountered) of all invertebrates in the greenway is the Sugarfoot fly (*Nemopalpus nearcticus*)(see appendix V for complete description). This unique fly is the only member of its sub-family known to occur in North America (Amoroso 1991) and the Sugarfoot Hammock location is one of only two sites from which it is known (the other is Gulf Hammock, Levy County). All that is known of this species is that adults are most active during the wettest part of the year, from June through October. The fly is active during the night and rests in the bark of trees during the day. The dominant tree species at the fly site are sweetgum, (*Liquidambar stryraciflua*), hophornbeam, (*Ostrya virginiana)*, sugarberry, (*Celtis laevigata)*, redbay, (*Persea borbonia)*, and swamp chestnut oak, (*Quercus michauxii)*. Without accurate field data, there is little that can be done to protect the species other than to leave its habitat as undisturbed as possible. This species is currently a candidate for listing by FGFWFC and is considered vulnerable.

Table III. Listed or Rare Plants and Animals of the Hogtown Creek Greenway

Status*	Scientific Name	Common name
	PLANTS	
T4	*Asplenium platyneuron*	ebony spleenwort
T4,T6	*Epidendrum conopseum*	greenfly orchid
T4	*Ilex ambigua*	carolina holly
T4	*Lobelia cardinalis*	cardinal flower
T3	*Rhaphidophyllum hystrix*	needle palm
T4	*Sabal minor*	little blue-stem palm
T4	*Selaginella apoda*	meadow spike moss
T4	*Selaginella ludoviciana*	spike moss
T3	*Smilax smallii*	jackson vine
T4	*Thelypteris cf. hispidula*	aspidium fern
T4	*Thelypteris dentata*	downy shield fern
T4	*Thelypteris kunthii*	wood fern
T4	*Tillandsia bartramii*	wild pine
T4;T6	*Tipularia discolor*	crane-fly orchid
T4	*Woodwardia areolata*	netted chain fern
	MAMMALS	
R	*Lutra canadensis*	river otter
T	*Peromyscus floridanus*	florida mouse
R	*Peromyscus gossypinus*	cotton mouse
E	*Peromyscus nuttalli*	golden mouse
R	*Sus scrofa*	feral pig
	BIRDS	
SC	*Anas fulvigula*	mottled duck
T M	*Grus canadensis*	sandhill crane
E	*Mycteria americana*	wood stork
R	*Ictinia mississippiensis*	mississippi kite
E N B	*Haliaeetus leucocephalus*	bald eagle
	HERPETOFAUNA	
SC	*Rana capito aesopus*	florida gopher frog
SC	*Alligator mississippi- ensis*	american alligator
RG	*Terrapene carolina bauri*	florida box turtle
RG	*Sternotherus m. minor*	loggerhead musk turtle
SC	*Gopherus polyphemus*	gopher tortoise
T	*Drymarchon corais couperi*	eastern indigo snake
SC	*Pituophis melanoleucus mugitus*	florida pine snake
T	*Stilosoma extenuatum*	short-tailed snake
	INVERTEBRATES	
C	*Nemopalpus nearcticus*	sugarfoot fly
R	*Ischnura prognatha*	furtive forktail
R	*Tachopteryx thoreyi*	gray petaltail
C	*Cordulegaster sayi*	say's spiketail dragonfly

* see appendices I, II, III and IV for explanantion of abreviations.

CONCLUSIONS AND MANAGEMENT RECOMMENDATIONS

GENERAL CONCLUSIONS

It is beyond the scope of this report to provide specific recommendations regarding the installation of specific trails, boardwalks, parking areas, observation decks, or any other public facilities along or adjacent to the greenway. As the greenway design process progresses, the City will require the participation of the appropriate advisors in site specific location of greenway facilities.

It is the goal of this report to provide some general management guidelines and baseline ecological information from which designers and other decision makers can draw. There are many more human and cultural resources available in the Gainesville community than could be mentioned in a report of this scale. However, we strongly recommend that these resources be sought out and incorporated into as many aspects of the greenway's design, implementation, management, etc. as is possible. Many of these resources are already part of City operations in other areas and need merely be adapted to fit the specific needs of the greenway. Numerous and varied resources are available through the University of Florida, Santa Fe Community College, the high schools and other academic institutions in the area. These and many more interests should be incorporated in the management of this public space -- their participation will ensure a more effective management effort and will significantly increase the community importance of the greenway.

The following paragraphs describe some basic guidelines important in making management policy for the greenway. Most of these are drawn from observations in the field, and summarized in Table lV below.

Table IV. MANAGEMENT RECOMMENDATIONS BY SURVEY SITES

SITE	EXOTIC REMOVAL	PRESCRIBED BURNS	THINNING	OTHER ENHANCEMENT	RESTORATION	MISC.
1	yes	no	minor	no	no	Maintain open water : aquatic vegetation ratio
2	yes	no	*Acer negundo, Broussenetia papyrifera*	no	no	
3	*Hydrilla*	no	no	no	no	
4	no	yes	no	dike improved	dike removed	
5	no	yes	no	no	no	
6	no	yes, to maintain	no	yes, gopher tortoise habitat	no	
7	no	no	no	yes, through cattle exclusion	no	
8	no	yes, on prairie	no	no	no	
9	no	yes, on prairie	no	no	no	
10	no	no	no	no	no	
11	yes	no	no	no	no	
12	no	no	yes, poison ivy	no	no	
13	no	yes	no	no	no	Probably not been burned over 20 years.
14		yes		yes	no	Trash pickup, burn
15	no	no	no	no	no	
16	no	yes	no	no	no	
17	no	no	no	no	no	
18	yes	yes	no	yes	no	Manage gopher tortoises and native plants
19	Eliminate feral pigs and dogs	no	no	no	no	
20	no	if possible	no	no	no	
21	yes	no	no	no	Repair of bike damage	Sheet flow not interrupted
22	yes	no	no	yes	no	
23	yes	no	yes		no	
24	no	no	no	no	no	
25	spot herbicide & manual removal of *Ardisia crenulata*	no	no	yes	yes	

In general, certain practices should be avoided throughout the greenway, e.g., tree cutting, removal of snags and stream log jams, or other ecologically disruptive maintenance practices. Activities to be encouraged include debris and trash removal (possibly using a volunteer system similar to that employed by FDOT along highways), some thinning in areas of early secondary plant development, the removal of exotics wherever it is feasible and the removal of all domestic dogs and cats encountered. All trash should be carefully defined as glass, plastic, paper, and other human made products, and not including natural wood, fallen trees, native rock, etc. No motorized vehicles (except for emergencies) should be allowed in any part of the greenway.

Facilities, trails and other structures should be designed to cause as little ecological disturbance as possible during construction. This point cannot be overemphasized. There are many areas throughout the greenway that may be able to support certain kinds of structures and activities, but which could be severely impacted by construction equipment and the process in general. Beyond this central concern, structure designs should be balanced between durability of structures and compatibility with functioning ecosystems.

In the event that greenway designers attempt to provide a "hard rock" crossing of the Creek for mountain bikes, the following measures are recommended. Connectivity should not be limited for mobile aquatic organisms; silt traps should be installed to reduce or eliminate addition of silt to the creek; access to the structure should be designed in such a way as to minimize the possibility of bank erosion. It is conceivable that such a crossing could work with minimal effects to the health of the creek. However, any such structure should be proposed as experimental and its effects carefully monitored before widespread use is considered. One notable potential benefit of such a structure may be to minimize other off-trail use simply because some "more challenging" features would be provided within the greenway framework.

All areas of Hogtown Creek are sensitive to human disturbance (see Map III). Headwater areas are perhaps more ecologically sensitive to human disturbance than the other two regions (midstream and prairie/lake), although this is partially due to the fact that headwater areas are generally confined to steep banks, and the narrow stream valleys and the soft ground in slope seepage. In these areas, recreational structures should be kept to a minimum and away from the stream and stream banks whenever possible. Heavy use will exacerbate stream bank erosion and increase sedimentation rates. Offsite factors from surrounding residential, commercial, and public uses are more acute in these areas and will need to be routinely monitored to insure that aesthetics, human health, vegetative cover, and rare species are not compromised.

Midstream areas are subject to sheet flow during periods of storm runoff. Stream channels meander widely over the floodplain valleys with each flood event. Former channels are abandoned and the character of the stream takes on a braided appearance. Recreational structures built under

these unstable conditions can be compromised with changes in the valley. This condition might encourage designers to attempt to over-stabilize structures. However, any such structures that disrupt sheet flow should be discouraged. Sheet flow, as it occurs presently, leaves behind numerous small pools which are used by amphibians and insects (including various mosquito species) for breeding. Structures or practices (such as chemical application for mosquito control) that interfere with this process should be avoided. Erosion, except for very localized areas, does not appear to be a major consideration. These areas require little direct management.

Kanapaha Prairie and Lake, and associated features, require intensive onsite management, particularly prescribed fire. Fires are needed in the prairie as well as some of the more woody swamp habitats along the perimeter to maintain the open aspect. Fires should be excluded from surrounding hammocks, and other management methods should be explored to maintain these areas. All prescribed burning must follow the specific guidelines set out by the "Five Year Fire Management Plan for Morningside Nature Center" (Johnson, 1990). We recommend that a similar five year fire plan be developed for greenway areas for which fire is a necessary ecological component. As is the case at Morningside, natural fires (caused by lightning) will probably have to be treated as wildfires in the greenway and put out. If a long-term plan for prescribed burns is not developed for the greenway, there is a risk that over-fueled fires could start and threaten areas outside of the greenway or ignite a muck fire.

Grazing animals could be used in some of the prairie and wetland areas for groundcover maintenance, but should be excluded from all forested areas. The City, County and DNR staff biologists should be consulted concerning methods for the management of mesic hammocks, as well as prairie habitats. A number of areas where exotic plants are over-abundant are indicated in Table IV. If herbicides are used, care should be taken to avoid contamination of the creek. A better method may be to remove plants manually with the help of volunteers.

Perhaps the strongest recommendation we can make is that the baseline floral and faunal survey work we have begun be intensified and completed for the entire greenway area in order to accurately determine what natural resources exist. Without this work, monitoring ecological changes in the greenway will have little relevance. At the same time, it should be pointed out that additional, experimental approaches should also be pursued (see Education section). Much of the approach to monitoring proposed here incorporates methods that promote further inventory work -- at the same time providing a snap-shot ecological view of particular sites, species or conditions. Principal in this approach is the inclusion of existing city experts (particularly Larry Johnson of Cultural and Nature Operations) and programs (such as that for prescribed burning), as well as non-City groups (such as university ecology classes and various garden and bird clubs), in the implementation of monitoring systems.

The specific goals of a monitoring program are: (1) to establish a framework through which biological and ecological changes can be readily observed; (2) to interface the greenway-specific monitoring programs with experts and programs now employed by the City, and to further interface with various non-City experts and resources; (3) to design monitoring studies in a manner that facilitates further inventory of the flora, fauna and other natural resources of the area; (4) to make all monitoring as cost and time efficient as possible; and (5), to make ecological evaluation, through monitoring, an integral part of the greenway experience through education.

Monitoring can be expensive and unproductive if not designed and conducted in an appropriate and efficient manner. Monitoring for the sake of monitoring should be avoided for more common-sense options. Given this, it should also be understood that there are no simple or quick solutions to monitoring ecological change in an area as ecologically varied as the greenway. The fact that the greenway is linear (with a massive edge:core ratio) and bordered on so many sides by so many different human activities, makes the challenge even greater. Clearly, some creative solutions are necessary. Two additional points should be made here. First, the best safeguard to

keeping the greenway's ecological integrity intact is to keep human disturbance to a minimum. This can be achieved by identifying the most appropriate areas in which human activity may be located and controlled. And second, monitoring and maintaining the gross ecological integrity of the system (rather than any one specific aspect or species) will have the effect of keeping the system habitable for most of the plants and animals that live in the area. This latter point is justified by the extraordinarily high cost of sampling mammals in particular. The emphasis of this study is on monitoring their habitats rather than their actual numbers at any given time, although this too is provided as a long-term option.

With the above goals and notes in mind, the overall greenway monitoring program should seek to regularly evaluate the following aspects. Plant community structure (includes ratio of open water to vegetated water on Lake Kanapaha), composition and dynamics; hydrology (flow rates, water levels, water quality, characteristics and sources of runoff; erosion and siltation rates); soil moisture levels; mammal occurrences and densities; bird occurrences, densities, nesting and reproductive success; exotic plant and animal densities; impacts of trails and trail use by different user groups (pedestrians, bikers, equestrians). These more specific monitoring options are summarized below and specific types of monitoring and the respective locations are indicated in Table V.

Water Quality

The hydrology of Hogtown Creek (flow rates, water levels, characteristics and sources of runoff; erosion and siltation rates,) and water quality are of critical importance to the health of the Hogtown Creek ecosystem. Even though it appears that the creek is in remarkably good condition following years of uncontrolled runoff, pollution and general abuse, no one has ever attempted to maintain or improve the creek ecosystem. This is a significant challenge, one that will require incorporating all of the above water management aspects.

Water quality is a key consideration for all vertebrates that need to drink, and especially those that find their food in the wetland itself (e.g. wading birds, raccoons, kingfishers, raptors),

and those that are wetland-dependent (most reptiles and amphibians). While aquatic vegetation responds most readily to phosphorus and other nutrients, measurements of water quality relevant to animal health do not focus on nutrient availability, but on disavailabilities and toxicities. The important considerations in this creek system include: minerals (pH, salinity, conductance), heavy metal concentrations, turbidity, and flow rates (relative to dissolved oxygen). All of these variables can be simply measured in the field, and should be monitored as construction of pathways continues.

Signs of severe and sudden fluctuations in volume and flowrate were detected, probably due to the numerous runoff inputs, many of which collect rainwaters on paved surface and deliver it quickly to the creek. Most native vertebrate stream fauna cannot tolerate frequent changes of this magnitude; young and nesting habitat are lost to erosion and chemical changes in the water, however temporary they may be. Flow (and the concomitant patterns of turbulence, siltation, and temperature fluctuation) is the "major limiting factor to stream life" (Odum 1971). Flow meters are inexpensive, unobtrusive, and are recommended to be installed above important runoff entry points to the stream, with the goal of stabilization or at least predictability of hydrological regime. While offtakes of water that lower the stream level are less common, they too should be regulated towards the above goal. Logically, a broad-scale cleanup effort should consider toxic inputs and regulate dumping at all points along the stream system. Wading birds and raptors are particularly susceptible to eggshell thinning from exposure to organochloride residues from common pesticides. Of many bird species tested in Florida, several present on the greenway have significantly shown this debilitating effect (anhinga, great blue heron, black-crowned night heron, and wood stork)(Ohlendorf et al. 1979).

This stabilization of hydrological regime does not rule out natural fluctuations. In this subtropical climate, seasonal and even daily variation in flow is natural and essential to the success of invertebrates and fish (Muller 1974). Other important variables simple to monitor are siltation rates and types, and evapotranspiration rates. The latter determines the relative humidity of

microhabitats important to invertebrate development, and hence to the insectivorous bats, shrews, rodents and birds.

Monitoring of adjacent off-site activities e.g. pesticide spraying, drainage, etc., in order to protect project area resources should be considered. This can be checked to a certain degree through policing efforts, but should be quantified through monitoring of water quality.

Water quality can be effectively, albeit crudely, monitored by sampling certain species of benthos. The nymph of the gomphiid dragonfly (*Progomphus obscurus*), an extensive stream bank burrowing species, is a good indicator of water quality -- while it can tolerate moderate levels of pollution, it is quite common and therefore easily collected. Some stream damselfly nymphs (*Calopteryx maculata*) are also good water quality indicators and should be monitored. Both of these insect species are abundant on the creek bottom in the 8th Avenue bottomlands. Minnows (*Notropis chalybaeus*), would also be an excellent candidate for monitoring since it is susceptible to changes in water quality and temperature. Densities of native versus exotic clams would also provide interesting information on the response of competing species to changes in water quality.

Soil moisture, compaction and loss levels;

Soil moisture levels should be monitored in selected areas around Lake Kanapaha in order to determine the humidity of microhabitats for shrews, bats, rodents, birds and soil dwelling insects. Soil compaction studies should be conducted on and adjacent to the different greenway trail types and other structures. These data will help quantify the impact of both on and off trail use by visitors on the soil structure and the consequent effect on soil dwelling creatures. Different trails will probably allow different user types (pedestrians, bikes, horses, etc.) and measures of soil compaction should be undertaken for each of these user types. Soil loss along trails and adjacent to structures should be measured throughout the greenway system. There are simple methods for doing this and these should be employed. In addition, siltation rates should be measured in creek areas as a component of soil loss, water quality and direct erosion monitoring.

Plants: community structure, composition and dynamics

Several approaches are proposed in this section, all of which address the diversity of community types, ecological problems and existing research programs.

Photopoints

The establishment of permanent photopoints throughout the greenway will allow for regular gross evaluation of the condition of the communities in which the points are established. A simple post and camera platform (with photo direction indicated on surface) would serve this purpose well and could also be set up as an educational tool for passersby as well as organized tour groups. Over time, a display of seasonal or annual photographs could be displayed adjacent to specific points or a collection could be displayed in an education center. Photopoints represent an excellent inexpensive means of evaluating change in vegetation characteristics, including cases of exotics removal and native vegetation enhancement.

Transects

Transect studies are recommended for areas in which ecotones (gradations or intersections between two or more community types) occur, or where other distinct physical features intersect or pass through a natural area (this includes Hogtown Creek as it meanders through various community types and trails which exist now and those which will be installed for the greenway). Belt transects are proposed similar to those already conducted by Larry Johnson (Johnson 1992). Transects of this type are particularly effective in measuring changes in the forest structure of a community and the gradation of changes, if they occur, at varying distances from a given point (e.g. a trail). Approximately 20, 5 m X 100 m transects should be distributed in a stratified random manner perpendicular to the creek. Plant identity (species) and size (DBH - Diameter at Breast Height) should be collected for trees larger than 20 cm DBH over the entire transect. On half the transect (5 m X 50 m), the same data should be collected for trees greater than 10 cm DBH but less than 20 cm DBH. On one fourth the transect (5 m X 25 m), the same data should be collected for plants greater than 5 cm DBH, but less than 10. For plants less than 5 cm DBH, 3

randomly located (within the transect) subplots 2.5 m X 5 m should be used in the same manner as above.

Transects should be permanently marked with pieces of re-bar at either end and temporarily marked with bamboo or plastic stakes every 5 m. Photopoints should be established at each end (no platform is necessary if photographs are taken from above re-bars). Transects should effectively evaluate the forest (or other habitat) structure as well as provide information about the density of exotic plants.

Plots

Plot studies are recommended for certain areas of the greenway supporting distinct and/or unique habitats. Plots can be designed to accomplish many different goals and consideration should be given to each site before a plot is installed. Greenway plot studies, in general, should be approximately 20 m X 20 m, and designed for monitoring at two year time intervals and should monitor vegetative structure, composition and dynamics. Plots can also be used to evaluate area responses to prescribed burns and exotics removal. Specific plot design should reflect specific goals of particular areas. A coordinative effort is suggested, between Cultural and Nature Operations and the University of Florida faculty of Botany, and/or the faculty of at least one high school in the area (P.K. Young or Gainesville High School).

Within plots, all trees should be identified, mapped, measured and tagged. All smaller individuals (in subplots) should also be identified, mapped, measured and tagged. Over time, such studies will indicate reproductive successes and failures of the included species and will show specific trends in the particular community -- whether certain species are becoming more dominant, whether other species are being excluded, etc. The knowledge gained from these studies will tell researchers whether the habitat suitability for particular animal species is increasing or decreasing or remaining constant. The long-term goal is to be able to make management decisions based on these (and other) findings.

Remote sensing

Aerial photography/remote sensing is recommended as a means of monitoring vegetative cover on Lake Kanapaha. The importance of maintaining an even ratio of closed (plant covered) to open water surface cannot be over-emphasized. Numerous wading birds depend directly on the aquatic life they harvest from Lake Kanapaha. In addition, a variety of shoreline rodents also depend on insects and amphibians whose populations depend on the proper water:vegetation ratio. The rodents, in turn, become the meals of raptors and larger mammals surrounding the lake. Thus, a proper balance at the lake surface is critical throughout the food chain of the southern end of the greenway. Annual or semi-annual overflights are conducted by FDOT and could provide adequate information to determine the status of the lake surface. It is very likely that this could be accomplished for not only Lake Kanapaha but for the entire greenway (for other vegetation types) through the Remote Sensing department at the University of Florida.

Mammals: occurrences and densities

A mammal species list based on signs, such as tracks, feces, vegetation damage, etc., was completed. However, no baseline data on population sizes have been collected. Therefore, any monitoring efforts to detect change would require this baseline information first. Mammals can be sampled in a variety of ways; if the goal is a fairly good estimate of present densities, not actual numbers, then samples based on trap grids or transects are the most efficient, conducted at least twice/year to account for seasonal variation in mobility. Small mammals are trapped in live traps or snap traps, which must be set on a grid of a scale appropriate to the mobility of the species of interest and with an appropriate bait (Swift & Steinhorst 1976). Trap grids must be set over a known area, the size of which depends on its heterogeneity as small mammal habitat. Bats are sampled by placing mist nets over streams, by pillowcase around, or hidden camera in, known cavities or other roosting sites, and by estimates of flock size when mass exits can be observed. Larger mammals such as raccoons, foxes, and deer can be sampled for relative density by track

counts. Wherever sandy open ground exists, which occurs very frequently along Hogtown Creek, tracking pits can be marked and monitored by regular sweeping and then counting the next morning. This type of data collection site is popular with visitors, if a pictorial guide to tracks is provided, but it must be protected from human interference if it is to be used by mobile mammals in a representative way. It is costly and dangerous to attempt trapping of the medium to large mammals.

The "meso-mammals" (3-8 kg.) can be maintained with simple preservation of treefalls and cavities, and some undisturbed banks of a stream system supporting healthy invertebrate populations (crayfish and snails are important food items). Bats are sensitive to a minimum area and density of trees, so partitioning some already small woodlot parcels would negatively impact some bat populations. River otters were anecdotally reported in Hogtown Creek about 30 years ago and again within the last ten years (Hutchinson, pers. comm.). The return of river otters, muskrats, and water rats (which are not disease-carrying pests like Norway rats) would require enhancement of waterflow and stream width in upper parts of the creek system. This seems to be and should be a desirable and feasible goal. They require healthy shellfish populations and some native reeds.

Small rodents and insectivores are common in each of the habitats encountered along the greenway. These animals are very susceptible to human disturbance: burrows and tunnels in grass are compressed by footpaths and soil compaction, seed and invertebrate food caches are lost to erosion, and nesting habitat is "cleared" (unsightly twig and leaf litter). The herbaceous layer is of crucial importance to these species, for food species and for cover from raptor predators.

Again, a baseline survey of densities of rare and common species is needed first, then a monitoring plan can begin to be conducted. Trapping grids should be set in a few isolated areas of large habitat segments, where human visitors won't disturb them, and they can be set for one week, twice a year, to record relative changes in frequency of the trapable species. A good compromise grid scale for the species here would be a 15m x 15m grid of Sherman and Museum Special traps over a 1 ha plot in each habitat. Mark-recapture studies after several years yield good relative

densities, but must be conducted systematically and consistently to meet statistical assumptions. It must be noted that some small mammals are "trap-shy" and not well represented by any known sampling method except complete clearing and removal, obviously inappropriate techniques for this project. Also, small mammals vary much more rapidly and drastically in population sizes over the course of seasonal and short-term habitat variations, so monitoring might not be useful until several years of data can be compared. Yet a few sensitive species should be watched as indicators of degradation, e.g. weasels, woodrat, golden mouse.

Care and vigilance will be required to maintain the small mammal communities present in some of these woods (Gottfried 1979), notably those where soil compaction and urban runoff toxicities are a problem. A hazard already threatening small mammal communities and the gopher tortoises (see Other Vertebrates), and that is sure to increase, is domestic predators. Dogs and cats will probably increase in presence on the greenway as connectivity and access points are increased. Packs of dogs grow in numbers when they can roam, and traveling a linear corridor gives them more access to each habitat than they currently have. This problem could eliminate several species unless strict leashing rules are enforced and fencing is provided along residential properties. Cats often reach densities where trapping them is the only effective means of discouraging their presence in the natural areas. The Gainesville Humane Society shelter will take cats and dogs not restrained by their owners.

Use by horses and large grazers

Horse trails are best if cleared of branches up to 15 feet high. They should be about six feet wide and on a base that is soft but durable enough to support these 1,000-1,800 lb. creatures. Erosion along horse trails is a distinct possibility, so trails should not be installed on slopes or near marshy areas.

The open prairie areas north of Lake Kanapaha need to be maintained by either frequent fire or grazers. The latter may be easier and safer. Either privately owned horses or bison from Payne's Prairie would be suitable and probably aesthetically pleasing to most greenway visitors.

However, horses require generally very expensive fencing and buffalo require more area than is currently available. Only 3-4 beasts could be sustained and would need to be exchanged frequently with the Payne's Prairie herd.

Birds: occurrences, densities, nesting and reproductive success

The highest diversity of bird species will be maintained if; (1) vertical heterogeneity is maintained (ground herbaceous cover, shrubs, saplings, mature trees and vines); (2) the mosaic of different aquatic microhabitats (various depths of water with emergent vegetation) are protected; and (3) the various nesting habitats currently used are not disturbed (Stouffer and Best, 1980).

Maintaining natural vegetation structure and heterogeneity should be considered an overall management recommendation. Not only will this practice provide the most usable habitat for the greenways bird species, but it will also support the most diverse array of mammal, and reptile species. This structure is effectively monitored by the photopoints and vegetative transect sampling.

Wading birds and raptors, being high on the food chain (piscivorous, carnivorous) are most vulnerable to disturbance: they need more area in which to collect food, they have more specific nesting habitat requirements, are territorial, and exist at lower densities than the passerines. To maintain the presently healthy populations (barred owl, red-shouldered hawk, bald eagle and osprey are breeding in the greenway, while vultures, other owls and hawks are frequent visitors), the important variable to watch is the ratio of open water to marshy shoreline (Segal, et al., 1987). An open lake with no marshy shore, e.g. a sinkhole, will only support ducks. It is the shallows full of minnows and insect larvae that keep the wading birds healthy, and support small rodents and amphibians which support raptors. The total area of Lake Kanapaha should not decrease, nor the upland shore around it be dried out at all for the sake of paths and parking. Human impacts in this region should be limited to a discrete boardwalk that circumvents the nesting habitat (tall reeds and sedges) and does not impact the shallow water habitat with much shade or pollution.

Bald eagles require solitary tall pine trees; a few suitable examples exist around Lake Kanapaha and Sugarfoot Hammock and these should not be disturbed. There is one active bald eagle nest on the greenway, just northeast of the old dike in Sugarfoot Hammock. This nest is at least five years old and sits in one of the only two tall pines suitable for eagle nests in the immediate area and should be considered a high priority for protection. The nest is officially registered with the US Fish and Wildlife Dept. (USFW#AL55) and their guidelines for protection should be carefully followed. According to USFW, a primary zone of "no disturbance" should be established in a 750' diameter around the nest tree. In addition, a secondary zone, 1500' in diameter, should also be established. This latter zone allows only minimal disturbance and "no development that will interfere with the eagle's ability to freely access it's hunting ground. We also recommend that a letter of compliance be filed with USFW early in the design and construction process in order to assure proper compliance, avoid nest abandonment and consequent federal law suits. Obviously, any trails or structures in this area should be very carefully considered. A distant observation deck is recommended for visitors and for monitoring. Ospreys require any tall solitary base, including power line towers, so they have abundant nesting habitat available. Of prime concern should be the wading birds, which nest in the tall reeds in the marshy fringe of Lake Kanapaha. This fringe must not be diminished or walked through, as they are shy and easily disturbed even to the point of abandoning nests. As mentioned before, all dead tree snags should be maintained for cavity-dwellers, and so small songbirds have plenty of choices of hardwood stands in which to nest.

Monitoring bird species occurrences, densities, nesting and reproductive success can best be accomplished through the assistance of local bird enthusiasts. Some of these groups and individuals are already involved in annual bird counts for areas within the greenway and would probably be enthusiastic about producing counts specific to the greenway and including all areas, as well as specifics about numbers of juveniles, territorial males, etc. A more thorough systematic sampling of passerines can be obtained from repeated strip transects and mist netting, but these techniques require expertise, patience, and some capital outlay (Conner & Dickson 1980). If the

objectives are to determine abundances, then systematic nest and call counts should be performed. As with mammals, there are some inconspicuous species that are impossible to monitor without extensive financial and time outlay, but the rest are feasibly counted and indicative of habitat preservation and disturbance levels.

Birds on open water are easily and accurately censused. Careful counts should be conducted four times per year to note any changes in resident or migrant species before they become permanent changes. The prairie region should be censused seasonally as it is a stopover on the route of migrating sandhill and even possibly whooping cranes (now being successfully reintroduced to Florida).

Reptiles, Amphibians, Fish and other organisms:

The gopher tortoise represents one of the few species occurring within the greenway that will benefit from direct management. All gopher tortoise areas should be marked with clear signs warning of penalties for harassment. No structures should be allowed within a 50 foot radius of any existing gopher tortoise burrows. Otherwise, as long as the burrows and food plants are not disturbed, tortoises are not incompatible with tourist use of areas around the habitat. In fact, exposure of the public to this rare, but visible colonial species can be a great educational attraction. Dogs pose the most serious threat to their continued success, and must be strictly leashed in these areas. Four freshly dog-excavated gopher tortoise burrows were discovered in the Sand Hill community. Additionally, alterations of hydrologic regime that might cause flooding of their sites should be prevented whenever possible. At least one of the gopher tortoise areas should be included in a plot study in order to evaluate their population densities and the abundance of important food plants.

A few other species merit special monitoring attention. Among these are the dragon and damselfly species mentioned earlier. These species are extremely rare and could be adversely affected by construction of boardwalks in the sensitive seepage areas. A greenway specific

entomological survey should be conducted by qualified entomologists, either on a volunteer or professional basis. Mr. Maufrey (mentioned earlier) could facilitate this effort.

As noted in an previous section, an isolated population of crayfish (*Procambarus talpoides*) was reported in the late 1930's from along the upper portion of Hogtown Creek. A survey should be conducted to determine whether this species is still extant in the Creek system. In addition, the rusty mud salamander (*Pseudotriton montanus floridanus*) was collected in Hogtown Creek in 1942 and a similar survey should be conducted to determine its status.

In general, snakes, salamanders, skinks, frogs, toads and numerous other organisms frequently inhabit standing and fallen dead trees, fallen branches and detritus on the ground or in the creek. These potential microhabitats should not be disturbed.

Table V	Type of Monitoring and Respective Sites					
Site	PP	TR	PT	TP	Other	Notes
1	X					
2					X	Soil Moisture
3	X	X				
4	X			X		
5		X	X			
6	X		X			Monitor after exclusion of cows
7	X		X			
8	X					
9	X	X				PP for burn areas, TR for ecotone of Prairie/forest
10					X	Water quality and Hydrology
12		X	X			
13	X					PP at perimeter
14		X	X			TR for burn areas
15						
16	X		X			PP for burn areas
17		X	X			PT to monitor levels of litter influx
18	X		X	X		
19		X				TR perpendicular to creek
20	X			X		PP of marsh from edge
21	X					PP from road down stream
22			X			
23					X	Water quality through benthics densities
24	X					
25	X					PP both up and down creek from earthen ridge

*PP= Photopoints, TR= Transects, PT= Plots, TP= Track Plots

CONSERVATION

The Hogtown Creek Greenway is large and varied enough to support numerous activity levels. Conservation areas are suggestive of a low human use level. Generally, moving from north to south and east to west, the level of conservation increases. The immediate creek corridor, springs, seepage areas, the Xeric Hammock and Sand Hill communities, are also very sensitive areas. Conservation areas of highest priority are in the western and southwestern portions of the greenway, and include all ecologically sensitive areas (see Map III). Sugarfoot Prairie, Sugarfoot Hammock and the west side of Lake Kanapaha are considered areas of high conservation value. The central cores of these areas should not be included in any general use plan for the greenway. The principal basis for this designation is that these areas are important migrant and resident bird nesting areas. However, the designation does not mean that the areas cannot be visited by humans.

Conservation areas require more limited access by people. Visitor access should be restricted to predetermined points and trails. No structures, except for scattered observation blinds and possibly a discrete observation tower, should be constructed. No bicycles or domestic animals should be allowed in these areas. In the eastern and northern greenway sites, where people need not be excluded, more restrictive barriers should be constructed in order to protect certain areas, especially the Sand Hill and Seepage areas.

Small groups of eco-tourists, the general public, school classes and other special interest groups, should be allowed to visit restricted areas under trained supervision. Neither specific areas suitable for such visits, nor their carrying capacity for visitors were determined for this study. This should be undertaken before conservation areas are opened to human visitors. The City should conduct a full scale study of the appropriate methods for providing access to restricted areas. The study should be structured to dove-tail with existing programs on eco-tourism, education, management and other relevant programs.

EDUCATION

The Hogtown Creek Greenway has much to offer the educational resources of Gainesville. The City will greatly improve the greenway's success by incorporating educational elements into all aspects of design. This conclusion is based on the fact that while ecological monitoring can measure changes over the long term, it is generally inadequate to "protect" the greenway ecosystem from damage by careless users. While there seems to be a great deal of support for the greenway project within the community, many users will wittingly or unwittingly abuse the ecosystem through direct or indirect ways. The less educated the user, the more damage that user will inflict upon the flora and fauna of the greenway.

A strong educational component should be a part of all design decisions. Education in the greenway should help people learn not only what the greenway is composed of, but also how they can use, and not abuse those components. The overall educational goal should be to get users interested enough in the greenway and its many resources that they will become advocates for and protectors of those resources.

Education in the greenway should have a number of specific goals. First, educational elements should be kept in ecological perspective. The greenway represents an ecosystem, the parts of which are linked together and interdependent. Second, the greenway should be treated as a living laboratory. Surrounding a creek and its associated habitats with development and providing access through the corridor is an experiment in balancing humanity and nature. Third, the greenway should have something for everyone, and it should be fun as well as interesting. While these latter observations may seem casual, it seems that without these elements, the greenway will not receive the commitment it needs.

The following suggestions are presented under the headings mentioned above and contain brief descriptions of some of the educational elements that would benefit the overall ecological health of the greenway. Table VI (p. 53) lists some of these elements as well, and indicates locations where they might be applicable in the greenway.

Living Laboratory

The ecological survey presented in this report provides baseline information about the greenway, but it is by no means a complete study of the area. Together with its suggestions and recommendations, the report provides the foundation for further, more complete ecological work in the greenway. Given that ecological investigation in the greenway could go on for many years without a lack of suitable study questions, research should be approached in a multifaceted manner. Some work, such as the monitoring discussed earlier, should proceed regularly and continue over the long-term. Other study projects could be short-term and ask specific questions. Still other work should focus on the making what is known ecologically, accessible to the public.

As in any scientific endeavor, the most important thing is to ask questions. It is then possible to attempt to find the specific answers to the question or hypothesis. The monitoring we have proposed is important. It provides basic information about the ecosystem. But it does not ask any specific questions. It should be an educational focus of the greenway to inspire visitors to ask questions about their surroundings. One of the most inspiring things about nature can be the discovery that so little is known about it. On the other hand, many people simply want to know what they are looking at or walking through or smelling, and this type of information should also be provided.

The following are suggestions to stimulate questions and discussion on the above points:

Community types: How they differ (Xeric Hammock vs. Floodplain Swamp), what to look for; what changes when you move from one to the next.

Geology: There are significant changes in geology between the northern and southern ends of the greenway. Important geological features and processes include limestone, aquifers, springs and seepage.

Hydric conditions: The various vegetation forms result from hydric processes; flooding, springs, seepage, runoff, etc. In addition, marshlands and floodplains act as water filtration systems.

Plants and Animals: The many plants and animals of the greenway are themselves, or can be used to point out unique ecological features of the area.

Plants:

- Specific exotic species and exotics ecology: Why do they do so well in a foreign place?
- Large or noteworthy trees: swamp bay, oaks, plane tree, magnolia and sweetgum: Why are these plants so big, can they get bigger?
- Devil's walking stick: Why do some plants have spines all over them?
- Prickly pear: Why is this called a pear? Gopher tortoises sometimes appear to have bloody mouths after engorging themselves on this bright pink fruit.
- Needle palm: why do some palms have needles and others don't?
- Jack-in-the-pulpit: is this a flower, a fruit, or what?
- Aquatics: how can some plants live entirely in water and others can't?
- Epiphytes: how do these plants live without any soil?

Animals:

Invertebrates:

- Benthic creatures
- Dragonfly keynotes
- Sugarfoot fly
- Bat and bird food
- Importance of mosquitoes and other bugs

Reptiles and amphibians:

- Gopher tortoise habitat
- gopher tortoise comensuals (other animals that live in the same burrows)
- Food plants
- Disease
- Dogs and other forms of disturbance to reptiles and amphibians
- Seasonality of reptiles and amphibians: sheading snakes and croaking frogs

Birds:

- Migrants vs. residents
- The ecology and importance of vultures
- How ospreys feed, what they depend on
- Nesting bald eagles
- Feeding ecology of water birds
- Different birds in different places: describe the respective habitats

Mammals:

- Tracks and other signs (feces, tree scratchings, trails)
- Marsh mammals like the marsh rat (how it differs from Norway rats)
- Water shrew and lake edge ecology
- Bats and the importance of caves and other bat roosts
- Otters and what they might need in order to return to the area
- Cows and what they do to the habitat in which they are grazed

Not everything has to be visible: It is often interesting to include signs indicating plant, animals or phenomena that *might* be apparent at any given time. For example, migrant birds, a dragonfly that is currently only a burrowing nymph, deer scratches on a tree, etc.

Keynote features and signage: A keynote feature like seepage areas or the springs in the northern part of the greenway, or the lake in the south -- could be incorporated into signs for that area to give it an identity with an important natural feature. For example, a greenway visitor might refer to their location in a section of the greenway by the presence of a lake motif in the signs, etc.

Questions with no answers: It is sometimes better to ask a question and get a person thinking rather than simply provide them with an answer they will soon forget.

Fire: Many opportunities to incorporate lessons about natural and induced (and suppressed) burning and the response of vegetation, animals and climate (signs could even talk about areas locally and around the world that are similar or dissimilar, such as tropical rain forests).

Bicycles: Exclusion of bicycles from certain areas like the Sand Hill is for specific reasons (e.g. could potentially disrupt gopher tortoise habitat). Provide truthful reasons why exclusion is important.

Experimental bike crossing of creek, or other experimental approach to multiuse problems: if it happens, promote the experimental nature of it in hopes that it will help to minimize the off-road use in other areas.

Awards for original ecological study in the greenway: we recommend that the awards be offered at high school and university level every year or two years to students proposing to conduct an original ecological study project in the greenway.

Greenways Science Project: We also recommend that a high school level competition be initiated between schools along the same theme as a science fair.

Greenways Calendar Competition: Some annual representation of the greenway, perhaps produced by local schools, for sale to help support research in the greenway.

Ecosystem Linking

Functionally, the greenway will be linking several areas of Gainesville that have been historically isolated. The greenway will also be linking a number of community types together through the thread of a trail. It will be advantageous to point out the natural links of the greenway as people visit along its new artificial linking device. Likewise, it will be beneficial to link all ecological elements in the greenway with specific education programs.

Links through space: How the stream changes from one end to the other, and how the sensitivity of surrounding areas changes from in a similar pattern.

Links through time: How the geology and past and present human occupation have shaped the greenway; from sharks teeth to limestone faults, to springs, to dikes, dams, fire suppression and polluted runoff.

Linking research studies and results to greenway visits: through display of photopoints show visitors changes of the same place over time.

Linking outside biological influences to the greenway: Exotic plants and animals dominate several areas and are causing the demise of some species within the greenway. *Tradescantia fluminensis* groundcover displacing native plants, domestic dogs are digging up and displacing gopher tortoises.

Linking human cultural sites: It is important to see what has happened over time and how the ecosystem has responded.

Something for Everyone

While it is not possible to please everyone, the more people that can appreciate the greenway in their own way, the more support the greenway will get from the community, and this will best serve the health of the ecosystem. While seeking to please the many varied interests of visitors, it will be wise to also provide educational materials in each of those approaches.

Areas with no signs: perhaps some areas should simply be left with no signs at all.

Locally produced signs: Have students from different schools research areas or subjects in or about the greenway and then write the signs for that area of the corridor.

Kids loop: Could provide a loop in the greenway specifically designed for children with interesting signs and other media provided at children's level.

Education tours: Tours will be popular in the greenway. And while it is assumed that some sort of training will be provided to those who wish to lead tours, it would be beneficial to also provide that training to girl and boy scouts, and to offer their "conservation badge" (or the appropriate honor) to those who lead tours or perform other ecologically beneficial service.

Eco-tourism: This could become an important source of foreign and out of state visitors to the area. An ecological basis is strongly recommended for tours. (Also see conservation section).

Toward an all Gainesville Greenway: While a recognized objective of this project is to link it with other natural areas and principal population centers in Gainesville, it would also be to the benefit of the greenway if more people from more areas of the City learned more about the corridor. Something should be done to attract people from other areas of the City, not just the neighborhood immediately adjacent to the greenway. Ultimately, it will be the commitments of all the citizens of Gainesville that defines how the greenway is used and cared for. And this will determine how visitors to Gainesville use the greenway and how the children of Gainesville are shaped by it and shape it's future.

TABLE VI. PRELIMINARY EDUCATIONAL OPPORTUNITIES

(Sites refer to Map I)

Site 1:	Bird blind; observation deck; boardwalk.
Site 2:	Large sabal palms and live oaks.
Site 3:	Aquatic vegetation; water birds; importance of lake ecology in food chain.
Site 4:	Eco-tourism highlighting human history, marsh and swamp habitat.
Site 5:	Limestone geology, fault line ecology, ecotone ecology, eco-tourism site, bald eagle nest.
Site 6:	Gopher tortoise ecology, gopher tortoise comensuals, ecotone ecology.
Site 7:	Impact of cattle on prairie, monitoring exclusion of cattle.
Site 8:	Camping and environmental education.
Site 9:	Large *Persea borbonia* trees.
Site 10:	Water quality monitoring; lichen lines on trees show high water levels.
Site 11:	Exotic plant *Tradescantia fluminensis* dominant as groundcover.
Site 12:	Rolling topography meets swamp area.
Site 13:	Migrant bird stopover area and nesting area.
Site 14:	Area of prescribed burn; study of vegetation response to fire.
Site 15:	Mature Swamp Forest and transition to Xeric Hammock.
Site 16:	Ecotone, Xeric Hammock to Floodplain Swamp; poison ivy.
Site 18:	Unique Sand Hill with high gopher tortoise activity and other typical SH features.
Site 19:	Survey work on migrant and resident songbirds; ecology of changing stream levels.
Site 20:	Wild rice; bird ecology.
Site 21:	Erosion control; mountain bike impacts on stream ecology.
Site 22:	Sheet-flow ecology; benthos monitoring; exper. stream crossing and study of impacts.
Site 23:	Springs ecology; fossils demonstrating geologic history.
Site 24:	Ring Park has many planted species not found in other areas of greenway.
Site 25:	Seepage ecology; erosion control; monitoring of exotics.

APPENDIX I

PLANTS OF THE HOGTOWN CREEK DRAINAGE BASIN

Scientific, common names and threatened and endangered status of plants known from the Hogtown Creek drainage system are provided here. The list includes 530 taxa, of which 62 are known only to genus. There are 30 species threatened, of special concern, uncommon or rare. 55 species are known to be exotics, some of which are invasive. Status is explained at end of table and the complete list by common name is provided following status explanation.

Scientific Name	Common Name	Status
Acer saccharum ssp. floridanum	Florida Maple	
Acer negundo	Boxelder	
Acer rubrum	Red Maple	
Acmella sp.		
Aesculus pavia	Red Buckeye	
Albizia julibrissin	Mimosa	I,E
Aleurites fordii	Tung Tree	E
Allium canadense	Wild Onion	
Alternanthera philoxeroides	Alligator Weed	I,E
Amaranthus australis	Southern Water Hemp	
Amaranthus hybridus	Common Pigweed	
Ambrosia artemesiifolia	Common Ragweed	
Ampelopsis arborea	Peppervine	
Amphicarpum muhlenbergianum	Little Blue Maidencane, Goober Grass	
Andropogon brachystachyus	Shortspike Bluestem	
Andropogon glomeratus	Bushy Beardgrass	
Andropogon sp.	Bluestem	
Andropogon ternarius	Splitbeard Bluestem	
Andropogon virginicus	Broomsedge	
Antenoron virginianum	Jumpseed	Uncommon
Antigonon leptopus	Coral Vine	E
Aralia spinosa	Devil's Walking Stick	
Ardisia crenata	Coral Ardisia	I,E
Arisaema dracontium	Green Dragon	
Arisaema triphyllum	Jack-in-the-pulpit	
Aristida sp.	Three-Awn Grass	

Aristida stricta	Wiregrass, Pineland 3-awn	
Arundinaria gigantea	Giant Cane	
Asimina angustifolia	Narrowleaf Pawpaw	
Asimina incarna	Showy Pawpaw, Flag Pawpaw, Polecat Bush	
Asimina parviflora	Pawpaw, Small-fruited Pawpaw	
Asimina sp.	Pawpaw	
Asplenium platyneuron	Ebony Spleenwort	T4
Aster dumosus	Aster	
Aster elliottii	Elliott's Aster	
Aster subulatus	Aster	
Axonopus sp.	Carpet Greass	
Azolla caroliniana	Mosquito Fern	
Baccharis glomeruliflora	Groundsel Tree	
Baccharis halimifolia	Saltbush	
Balduina angustifolia	Yellow Buttons	
Bambusa multiplex	Hedge Bamboo	E
Begonia cucullata	Wax Begonia	I,E
Berchemia scandens	Rattan Vine	
Berlandiera subacaulis	Green-Eyes	
Bidens alba	Beggar Ticks	
Bidens bipinnata	Beggar Ticks	
Bidens laevis	Bur Marigold	
Bidens mitis	Beggar Ticks	
Bignonia capreolata	Cross Vine	
Boehmeria cylindrica	False Nettle	
Boerhavia diffusa	Red Spiderling, Wine-flower	
Boerhavia erecta	Spiderling	
Brachiaria ramosa	Browntop Millet	E
Brasenia shreberi	Water Shields	
Bromus cf. unioloides	Rescuegrass	
Broussonetia papyrifera	Japanese Paper Mulberry	E
Buchnera floridana	Bluehearts	
Bulbostylis sp.	Hair Sedge	
Bulbostylus ciliatifolia	Capillary Hair Sedge	
Bumelia anomala		
Bumelia lanuginosa	Gum Bumelia	
Bumelia reclinata var. *reclinata*	Bumelia	
Buxus sp.	Boxwood	E
Cabomba caroliniana	Fanwort	
Callicarpa americana	Beauty Berry	
Calystegia sepium		
Campsis radicans	Trumpet Vine	
Cardamine parviflora	Cress	
Carex alata	Sedge	
Carex amphibola	Sedge	

Carex comosa	Sedge	
Carex crinita	Sedge	
Carex fissa var. *aristata*	Sedge	
Carex folliculata	Sedge	
Carex intumescens	Sedge	
Carex lupulina	Sedge	
Carex sp.	Sedge	
Carex sp. *1*	Sedge	
Carex sp. *2*	Sedge	
Carex sp. *3*	Sedge	
Carex stipata	Sedge	
Carphephorus corymbosus	Indian Paintbrush	
Carpinus caroliniana	Blue Beech, Mussle Wood	
Carya aquatica	Water Hickory	
Carya glabra	Pignut Hickory	
Carya tomentosa	Mockernut Hickory	
Chamaecrista fasciculata	Partridge Pea	
Chamaecrista nictitans	Partridge Pea, Sensitive Plant	
Castanea pumila	Chinquapin	
Catalpa bignonioides	Catalpa	
Celtis laevigata	Sugarberry	
Cenchrus echinatus	Southern Sandspur	
Centella asiatica	Coinwort	
Cephalanthus occidentalis	Button Bush	
Ceratophyllum demersum	Coontail	
Cercis canadensis	Redbud	
Chaerophyllum tainturieri	Wild Chervil	
Chamaesyce hirta	Hairy Spurge	
Chamaesyce hyssopifolia	Hyssop-Leaf Spurge, Eyebane	
Chasmanthium sessiliflorum	Longleaf Spike-grass	
Chenopodium ambrosioides	Mexican Tea	
Chenopodium giganteum		
Chionanthus virginicus	Old-man's-Beard, Fringe Tree	
Chloris petrea	Fingergrass	
Cicuta mexicana	Water Hemlock	
Cinnamomum camphora	Camphor Tree	I,E
Cirsium horridulum	Thistle	
Citrus sp.	Citrus	E
Cladina sp	Deermoss (Lichen)	
Cladonia sp.	Deermoss (Lichen)	
Claveria sp.	Coral Fungi	
Clematis catesbyana	Satin Curls	Rare, 2
Clematis crispa	Leather Flower	
Clematis terniflora	Virgin's Bower	E
Clematis virginiana	Virgin's Bower	
Climacium americanum	Moss	

Cnidoscolus stimulosus	Tread Softly	
Colocasia esculentum	Wild Taro	I,E
Commelina virginica	Dayflower	
Cornus florida	Flowering Dogwood	
Cornus foemina	Stiff Dogwood	
Crataegus flava	Summer Haw	
Crataegus marshallii	Parsley Haw	
Crataegus sp.	Hawthorne	
Crataegus uniflora	One-flowered Haw	
Crotalaria lanceolata	Rattlebox, Lance-Leaf Rattlebox	
Crotalaria pallida	Rattlebox	
Crotalaria rotundifolia	Rabbit-Bells	
Crotalaria sp.	Rattlebox	
Crotalaria spectabilis	Showy Rattlebox	
Croton trinitatus		
Crysobalanus icaco	Coco Plum	
Cuscuta compacta	Dodder	
Cynanchum scoparium	Milkweed Vine	
Cynodon dactylon	Bermuda Grass	I,E
Cyperus globulosus	Globe Sedge	
Cyperus retrosus	Cylindric Sedge	
Cyperus sp. *1*	Flat Sedge	
Cyperus sp. *2*	Flat Sedge	
Cyperus sp. *3*	Flat Sedge	
Cyperus strigosus	Sedge	
Cyperus tetragonus	Sedge	
Dalea sp.	Summer Farewell	
Decumaria barbara	Climbing hydrangea	
Descurainia pinnata	Tansy Mustard	
Desmodium incanum	Sticktights	
Desmodium sp.	Beggar's Lice	
Dichondra carolinensis	Pony Foot	
Digitaria sp.	Crabgrass	
Digitaria villosa	Shaggy Crabgrass	
Diodia teres	Poor Joe	
Diodia virginiana	Diodia, Buttonweed	
Dioscorea bulbifera	Air Potato	I,E
Dioscorea floridana	Wild Yam	
Dioscorea quaternata	Wild Yam	
Diospyros virginiana	Common Persimmon	
Dulichium arundinaceum	Three-way Sedge	
Dumortiera sp.	Liverwort	
Echinochloa crus-galli	Barnyard Grass	E
Eichhornia crassipes	Water Hyacinth	I,E
Elaeagnus canadensis		
Eleocharis sp.	Spikerush	

Elephantopus carolinianus	Elephant's Foot	
Elephantopus elatus	Florida Elephant's Foot	
Elephantopus tomentosus	Elephant's Foot	
Eluesine indica	Goosegrass	E
Elytraria caroliniensis	Carolina Scaly Stem	Uncommon
Epidendrum conopseum	Greenfly Orchid	T4,T6
Eragrostis spectabilis	Purple Lovegrass	
Eremochloa ophiuroides	Centipede Grass	E
Erianthus giganteus	Sugar Cane Plumegrass	
Erigeron quercifolius	Oak-Leaf Fleabane	
Erigeron strigosus	Daisy Fleabane	
Eriobotrya japonica	Loquat	E
Eriogonum tomentosum	Wild Buckwheat	
Eryngium baldwinii	Creeping Eryngo	
Erythrina herbacea	Cherokee Bean, Coral Bean	
Euonymous americanus	Hearts -a'- Bustin	
Eupatorium capillifolium	Dog Fennel	
Eupatorium compositifolium	Sticky Dog Fennel, Yankee Weed	
Eupatorium mohrii	Thoroughwort	
Eupatorium perfoliatum	Boneset	
Eupatorium pilosum	Hairy Thoroughwort	
Eupatorium serotinum	Late Thoroughwort	
Eupatorium sp.	Thoroughwort	
Eutodon seductrix	Moss	
Fagus grandifolia	Beech	Rare in Co.
Forestiera acuminata	Privet	
Forestiera godfreyi	Godfrey's Privet	Rare
Forestiera ligustrina	Hammock Privet	
Fraxinus americana	White Ash	
Fraxinus caroliniana	Water Ash	
Fraxinus pennsylvanica	Green Ash	
Fraxinus profunda	Pumpkin Ash	
Fraxinus sp.	Ash	
Galactia mollis	Milk Pea	
Galactia volubilis	Milk Pea	
Galium aparine	Bedstraw, Cleavers	
Galium hispidulum	Bedstraw	
Galium pilosum	Bedstraw	
Galium sp.	Bedstraw	
Galium tinctorium	Bedstraw	
Galium uniflorum	Bedstraw	
Gaylussacia alba		
Gaylussacia nana	Dangleberry	
Gaylussacia tomentosa	Dangleberry	
Geastrum sp.		
Gelsemium sempervirens	Yellow Jessamine	

Geranium carolinianaum	Polecat Geranium	
Glandularia pulchella	Verbena, Moss Verbena	E
Guara angustifolia	Southern Gaura	
Hamamelis virginiana	Witch Hazel	Uncommon
Haplopappus divaricata	Scratch Daisy	
Hedera helix	English Ivy	I,E
Hedyotis procumbens	Innocence	
Hedyotis uniflora	Fairy Footprints	
Helianthemum arenicola	Rockrose	
Helianthemum sp.	Rockrose	
Hemerocallis arenicola	Day Lilly	E
Heterotheca subaxillaris	Camphorweed	
Hibiscus moschueteus	Swamp Mallow	
Hieracium gronovii	Hawk's-beard	
Hydrocotyle ranunculoides	Pennywort	
Hydrocotyle sp.	Pennywort	
Hydrocotyle umbellata	Marsh Pennywort	
Hydrocotyle verticillata	Whorled pennywort	
Hymenocallis rotata	Spider Lilly	
Hypericum hypericoides	St. Andrews Wort	
Hypericum sp.	St. John's Wort	
Hypnum lindbergii	Moss	
Hypoxis leptocarpa	Clubpod Stargrass	
Hypoxis micrantha	Pinelands Yellow Stargrass	
Hypoxis rigida	Stargrass	
Hyptis mutabilis	Bushmint	E
Ilex ambigua	Carolina Holly	T4
Ilex cassine	Dahoon	
Ilex glabra	Inkberry, Gallbery	
Ilex opaca	American Holly	
Ilex vomitoria	Yaupon	
Imperata cylindrica	Cogon Grass	
Indigofera hirsuta	Hairy Indigo	E
Indigofera spicata	Creeping Indigo	E
Ipomoea hederacea	Indigo	E
Ipomoea pandurata	Manroot; Wild Potato Vine	
Ipomoea sp.	Morning Glory	
Ipomoea cordatotriloba		
Iresine diffusa	Bloodleaf	
Iris sp.	Flag	
Itea virginica	Virginia-Willow	
Juncus coriaceus	Rush	
Juncus effusus	Soft Rush	
Juncus elliottii	Eliott's Rush	
Juncus megacephalus	Rush	
Juncus scirpoides	Scirpus Rush	

Juncus sp.	Rush	
Juniperus silicicola	Southern Red Cedar	
Justicia americana	Water Willow	
Krigia virginica	Dwarf Dandelion	
Lactuca floridana	Wood-Lettuce	
Lagerstroemia indica	Crape Myrtle	E
Lantana camara	Lantana	
Lechia sp.	Pinweed	
Leersia hexandra	Southern Cutgrass	
Leersia virginica	Whitegrass	
Lemna minor	Duckweed	
Lemna obscura	Duckweed	
Lemna valdiviana	Duckweed	
Lepidium virginicum	Pepper Grass	
Licania michauxii	Gopher Apple	
Ligustrum japonicum	Japanese Privet	I,E
Ligustrum lucidum	Glossy Privet	I,E
Ligustrum sinense	Chinese Privet	I,E
Limnobium spongia	Frog's Bit	
Linaria canadensis	Toadflax	
Liquidambar styraciflua	Sweetgum	
Lithospermum tuberosum	Pucoon	Uncommon
Lobelia cardinalis	Cardinal Flower	T4
Lolium perenne	Ryegrass	
Lonicera sempervirens	Coral Honeysuckle	
Loriope spicata	Monkey Grass	
Ludwigia cf. palustris		
Ludwigia decurrens	Primrose Willow	
Ludwigia octovalvis	Primrose Willow	
Ludwigia peruviana	Primrose Willow	I
Lygodium japonicum	Climbing Fern	I,E
Lyonia ferruginea	Rusty Lyonia	
Lyonia lucida	Fetterbush	
Macfadyena ungus-cati	Cat Claw	E
Magnolia grandiflora	Bull Bay	
Magnolia virginiana	Sweetbay	
Melanthera nivea		
Melia azedarach	Chinaberry	E
Melothria pendula	Wild Cucumber	
Merremia dissecta	Cutleaf Morning Glory	
Mikania scandens	Climbing Hempweed	
Mitchella repens	Partridge Berry	
Mnium cuspidatum	Moss	
Modiola caroliniana		
Monarda punctata	Horsemint	
Monotropa uniflora	Indian Pipe	

Morus alba	White Mulberry	E
Morus rubra	Red Mulberry	
Myrica cerifera	Wax Myrtle	
Myrica heterophylla	Northern Bayberry	
Myriophyllum aquaticum	Parrot's Feather	E
Nasturtium cf. officinale	Water-Cress	E
Nelumbo lutea		
Nuphar luteum	Spatter-Dock	
Nyssa sylvatica	Sour Gum, Tupelo	
Nyssa sylvatica var. *biflora*	Sour Gum, Black Gum	
Oenothera biennis	Evening Primrose	
Oenothera laciniata	Cut-Leaved Primrose	
Oplismenus setarius	Basket Grass	E
Opuntia humifusa	Prickly Pear	
Osmunda cinnamomea	Cinnamon Fern	
Osmunda regalis	Royal Fern	
Ostrya virginiana	Hophornbeam; Ironwood	
Oxalis corniculata	Lady's Sorrel	
Oxalis corymbosa	Violet Wood Sorrel	E
Oxalis sp.	Wood Sorrel	
Oxalis stricta	Yellow Wood Sorrel	
Panicum anceps	Hairy Panicum	
Panicum angustifolium	Thinleaf Panicum	
Panicum commutatum	Variable Panicum	
Panicum dichotomum	Forked Panicum	
Panicum hemitomon	Maidencane	
Panicum laxiflorum	Drooping Panic Grass	
Panicum maximum	Guinea Grass	E
Panicum repens	Torpedo Grass	I,E
Parietaria praetermissa	Pellitory	
Parthenocissus quinquifolia	Virginia Creeper	
Paspalum notatum	Bahia Grass	I,E
Paspalum setaceum	Bare-Stem Papalum	
Passiflora incarnata	Maypop, Passion Flower	
Passiflora lutea	Yellow Passion Flower	
Persea borbonia	Red Bay	
Persea palustris	Swamp Bay	
Petiveria alliacea	Guinea-hen Weed	
Phaeoceros sp.	Hornwort	
Phlox drummondii	Phlox	
Phoradendron serotinum	Mistletoe	
Physalis carpenteri	Ground Cherry	Rare
Phytollaca americana	Pokeweed	
Pilea pumila	Clearweed	
Pinus clausa	Sand Pine	
Pinus elliotii	Slash Pine	

Pinus glabra	Spruce Pine	
Pinus palustris	Longleaf Pine	
Pinus serotina	Pond Pine	
Pinus taeda	Loblolly Pine	
Piptochaetium avenaceum	Black Needle Grass	
Pityopsis graminifolia	Grass-Leaf Golden Aster	
Planera aquatica	Water Elm, Planer Tree	
Plantago lanceolata	English Plantain, White-Man's Footsteps	E
Plantago major	Plantain	E
Plantago virginica	Southern Plantain	
Poa annua	Annual Bluegrass	
Podocarpus macrophylla	Podocarpus	E
Poinsettia cyathophora	Painted Leaf	
Polygonatum biflorum	Solomon's Seal	
Polygonella gracilis	Wireweed	
Polygonum densiflorum		
Polygonum hydropiperoides	Smartweed, Water Pepper	
Polygonum pensylvanicum	Knotweed	
Polygonum punctatum	Dotted Smartweed	
Polygonum sp.	Knotweed	
Polymnia uvedalia	Bear's Foot	
Polypodium polypodiodes	Resurrection Fern	
Pontederia cordata	Pickerelweed	
Prunus americana	Cherry	
Prunus caroliniana	Cherry-laurel	
Prunus serotina	Black Cherry	
Prunus umbellata	Flatwood Plum	
Psoralea sp.	Puckroot	Rare
Ptelia trifoliata	Hoptree	Uncommon
Pteridium aquilinum	Bracken Fern	
Quercus alba	White Oak	Uncommon
Quercus austrina	Bluff Oak	
Quercus falcata	Southern Red Oak	
Quercus geminata	Sand-live Oak	
Quercus hemisphaerica	Laurel Oak	
Quercus incana	Bluejack Oak	
Quercus laevis	Turkey Oak	
Quercus laurifolia	Diamond-leaf Oak, Laurel Oak	
Quercus michauxii	Swamp Chestnut Oak	
Quercus nigra	Water Oak	
Quercus phellos	Willow Oak	
Quercus pumila	Runner Oak	
Quercus shumardii	Shumard Oak	
Quercus stellata	Post Oak	
Quercus virginiana	Live Oak	

Rhaphidophyllum hystrix	Needle Palm	T3
Rhexia mariana	Pale Meadow Beauty	
Rhexia sp.	Meadow Beauty	
Rhododendron canescens	Wild Azalea	
Rhus copallina	Winged Sumac	
Rhynchospora caduca	Falling Beakrush	
Rhynchospora colorata		
Rhynchospora divergens		
Rhynchospora miliacea	Millet Beakrush	
Rhyncosia sp.		
Ribes sp.	Gooseberry	
Richardia scabra	Mexican Clover	
Rivina humilis	Rouge Plant	
Rosa palustris	Swamp Rose	
Rubus argutus	Highbush Blackberry	
Rubus cuneifolius	Sand Blackberry	
Rubus trivialis	Dewberry	
Ruellia caroliniensis	Wild Petunia	
Ruellia brittoniana	Mexican Wild Petunia	E
Rumex crispus	Curly Dock	
Rumex hastatulus		
Sabal minor	Little Blue-stem Palm	T4
Sabal palmetto	Cabbage Palm	
Sacciolepis sp.	Capscale	
Sageretia minutiflora	Climbing Buckthorn	Uncommon
Sagittaria latifolia	Common Arrowhead	
Salix caroliniana	Coastal Plain Willow	
Salvinia minima	Water Spangles	
Sambucus canadensis	Elderberry	
Sanicula canadensis	Black Snakeroot	
Sapindus saponaria	Florida Soapberry	Uncommon
Sapium sebiferum	Chinese Tallow Tree	I,E
Sassafras albidum	Sassafras	
Saururus cernuus	Lizard's Tail	
Scirpus californicus	Bulrush	
Scirpus sp.	Bulrush	
Scirpus sp. *2*	Bulrush	
Scleria sp.	Nut Sedge	
Scleria triglomerata	Whip Nut Rush	
Sebastiania fruticosa	Sebastian Bush	Uncommon
Selaginella apoda	Meadow Spike Moss	T4
Selaginella ludoviciana	Spike Moss	T4
Serenoa repens	Saw Palmetto	
Sesbania vesicaria	Bladderpod	
Setaria geniculata	Knotroot Foxtail	
Sida acuta	Broomweed	

Sida cordifolia		E
Sida rhombifolia	Tea Weed, Indian hemp	
Sisyrinchium atlanticum	Blue-eyed Grass	
Sisyrinchium rosulatum		
Smilax auriculata	Green Briar	
Smilax bona-nox	Green Briar	
Smilax glauca	Wild Sarsparilla	
Smilax laurifolia	Bamboo Vine	
Smilax pumila	Sarsparilla Vine	
Smilax rotundifolia	Green Briar	
Smilax smallii	Jackson Vine	T3
Smilax sp.	Green Briar	
Smilax tamnoides	Cat Briar	
Solanum americanum	Nightshade	
Solanum nigrescens	Black Nightshade	
Solidago canadensis	Goldenrod	
Solidago laevenworthii	Goldenrod	
Sonchus asper	Spiny-leaved Sow-Thistle	
Sonchus oleraceus	Common Sow-Thistle	
Sorghum halapense	Johnson Grass	E
Spiranthes cernua	Ladies' Tresses	T4
Spirodela punctata	Duckweed	
Sporobolis clandestinus	Hidden Dropseed	
Stachys floridana	Hedge Nettle, Florida Betony	
Stenotapharum secundatum	St. Augustine Grass	
Symplocos tinctoria	Sweetleaf, Horse Sugar	
Taraxacum officinale	Common Dandelion	E
Taxodium distichum	Bald Cypress	
Teucrium canadense	Wood Sage	
Thelypteris cf. hispidula	Aspidium Fern	T4
Thelypteris dentata	Downy Shield Fern	T4
Thelypteris kunthii	Wood Fern	T4
Thelypteris sp.	Shield Fern	T4
Thunbergia alata		
Tilia caroliniana	Basswood, Linden	
Tillandsia bartramii	Wild Pine	T4
Tillandsia recurvata	Ball-moss	
Tillandsia usneoides	Spanish Moss	
Tipularia discolor	Crane-Fly Orchid	T4;T6
Toxicodendron radicans	Poison Ivy	
Toxicodendron toxicarium	Poison Oak	
Trachelospermum jasminoides	Confederate Jasmine	E
Tradescantia fluminensis	Wandering Jew	I,E
Tradescantia ohiensis	Spiderwort	
Trichostema dichotomum	Bastard Pennyroyal, Blue Curls	
Tridens flavus	Tall Redtop	

Trifolium repens	White Clover	
Trillium maculatum	Wake Robbin, Toad Trillium	Rare in county
Triplasis americana	Perennial Sandgrass	
Typha latifolia	Common Cattail	
Typha sp.	Cattail	
Ulmus alata	Winged Elm	
Ulmus americana	American Elm	
Urena lobata	Caesar-Weed	I,E
Vaccinium arboreum	Sparkleberry	
Vaccinium corymbosum	Highbush blueberry	
Vaccinium darowii	Darrow's Blueberry	
Valeriana scandens	Valerian	
Verbena bonariensis		E
Verbena hastata		
Verbesina virginica	Frost Weed	
Vernonia gigantea	Iron Weed	
Vernonia sp.	Iron Weed	
Viburnum dentatum	Haw, Arrow Wood	
Viburnum obovatum	Walter Haw	
Viburnum rufidulum	Rusty Blackhaw	
Viburnum dentatum var. *scabrellum*		
Viola esculenta	Violet	
Viola floridana	Florida Violet	
Viola septemloba	Seven-Lobed Violet	
Viola sp.	violet	
Viola sp.*1*	violet	
Viola sp.*2*	violet	
Viola walteri	Walter's Violet	
Vitis aestivalis	Summer Grape	
Vitis rotundifolia	Scuppernong, muscadine	
Vitis sp.	Grape	
Vitis vulpina	Frost Grape	
Wisteria frutescens	American Wisteria	
Wisteria sinensis	Chinese Wisteria	I,E
Wisteria sp.	Wisteria	
Wolffia columbiana	Water Meal	
Wolffiella gladiata	Bog-Mat, Mud-Midget	
Woodwardia areolata	Netted Chain Fern	T4
Woodwardia virginica	Virginia Chain Fern	
Xanthosoma sagittifolium	Elephant Ear	E
Xyris sp.	Yellow-Eyed Grass	
Youngia japonica		E
Yucca filamentosa	Adam's Needle, Bear Grass	
Zanthoxylum clava-herculis	Hercules Club	
Zizaniopsis miliacea	Southern Wild Rice	

STATUS:
T = Plant considered Threatened by the source indicated by number
SC = Plant considered to be of Special Concern by the source indicated by number
R = Rare either locally or regionally
U = Uncommon either locally or regionally
I = Plant is Invasive
E = Plant is an Exotic

Sources consulted for status:
1 = FGFWFC 2 = FNAI 3 = DW 4 = FDA 5 = USFWS 6 = CITES

CITES = Convention on International Trade in Endangered Species of Wild Fauna and Flora.
DW = Rare and Endangered Biota of Florida; Volume 5, Plants, Edited by Daniel B. Ward, 1976, University of Florida Press.
FDA = Florida Department of Agriculture (List published in Preservtion of Native Flora of Florida Act, Section 581.185-187, Florda Statutes), 1990.
FGFWFC = Florida Game and Fresh Water Fish Commission; Official Lists of Endangered and Potentially Endangered Fauna and Flora in Florida, 1990.
FNAI = Florida Natural Areas Inventory, Special Plant and Lichen List, 1990.
USFWS = United States Fish and Wildlif Service (List published in List of Endangered and Treatened Wildlife and Plants, 50 CFR 17.11-12)

PLANTS OF THE HOGTOWN CREEK DRAINAGE BASIN LISTED BY COMMON NAME

Common Name	Scientific Name	Status
Adam's Needle, Bear Grass	*Yucca filamentosa*	
Air Potato	*Dioscorea bulbifera*	I,E
Alligator Weed	*Alternanthera philoxeroides*	I,E
American Elm	*Ulmus americana*	
American Holly	*Ilex opaca*	
American Wisteria	*Wisteria frutescens*	
Annual Bluegrass	*Poa annua*	
Ash	*Fraxinus* sp.	
Aspidium Fern	*Thelypteris cf. hispidula*	T4
Aster	*Aster dumosus*	
Aster	*Aster subulatus*	
Bahia Grass	*Paspalum notatum*	I,E
Bald Cypress	*Taxodium distichum*	
Ball-moss	*Tillandsia recurvata*	
Bamboo Vine	*Smilax laurifolia*	
Bare-Stem Papalum	*Paspalum setaceum*	
Barnyard Grass	*Echinochloa crus-galli*	E
Basket Grass	*Oplismenus setarius*	
Basswood, Linden	*Tilia caroliniana*	
Bastard Pennyroyal, Blue Curls	*Trichostema dichotomum*	
Bear's Foot	*Polymnia uvedalia*	
Beauty Berry	*Callicarpa americana*	
Bedstraw, Cleavers	*Galium aparine*	
Bedstraw	*Galium hispidulum*	
Bedstraw	*Galium pilosum*	
Bedstraw	*Galium* sp.	
Bedstraw	*Galium tinctorium*	
Bedstraw	*Galium uniflorum*	
Beech	*Fagus grandifolia*	Rare in Co.
Beggar Ticks	*Bidens alba*	
Beggar Ticks	*Bidens bipinnata*	
Beggar Ticks	*Bidens mitis*	
Beggar's Lice	*Desmodium* sp.	
Bermuda Grass	*Cynodon dactylon*	I,E
Black Cherry	*Prunus serotina*	
Black Needle Grass	*Piptochaetium avenaceum*	
Black Nightshade	*Solanum nigrescens*	
Black Snakeroot	*Sanicula canadensis*	
Bladderpod	*Sesbania vesicaria*	

Bloodleaf	*Iresine diffusa*	
Blue Beech, Mussle Wood	*Carpinus caroliniana*	
Blue-eyed Grass	*Sisyrinchium atlanticum*	
Bluehearts	*Buchnera americana*	
Bluejack Oak	*Quercus incana*	
Bluestem	*Andropogon* sp.	
Bluff Oak	*Quercus austrina*	
Bog-Mat, Mud-Midget	*Wolffiella gladiata*	
Boneset	*Eupatorium perfoliatum*	
Boxelder	*Acer negundo*	
Boxwood	*Buxus* sp.	E
Bracken Fern	*Pteridium aquilinum*	
Broomsedge	*Andropogon virginicus*	
Broomweed	*Sida acuta*	
Browntop Millet	*Brachiaria ramosa*	E
Bull Bay	*Magnolia grandiflora*	
Bulrush	*Scirpus californicus*	
Bulrush	*Scirpus* sp.	
Bulrush	*Scirpus* sp. *2*	
Bumelia	*Bumelia reclinata* var. *reclinata*	
Bur Marigold	*Bidens laevis*	
Bushmint	*Hyptis mutabilis*	E
Bushy Beardgrass	*Andropogon glomeratus*	
Button Bush	*Cephalanthus occidentalis*	
Cabbage Palm	*Sabal palmetto*	
Caesar-Weed	*Urena lobata*	I,E
Camphor Tree	*Cinnamomum camphora*	I,E
Camphorweed	*Heterotheca subaxillaris*	
Capillary Hair Sedge	*Bulbostylus ciliatifolia*	
Capscale	*Sacciolepis* sp.	
Cardinal Flower	*Lobelia cardinalis*	T4
Carolina Holly	*Ilex ambigua*	T4
Carolina Scaly Stem	*Elytraria caroliniensis*	Uncommon
Carpet Greass	*Axonopus* sp.	
Cat Briar	*Smilax tamnoides*	
Cat Claw	*Macfadyena ungus-cati*	E
Catalpa	*Catalpa bignonioides*	
Cattail	*Typha* sp.	
Centipede Grass	*Eremochloa ophiuroides*	E
Cherokee Bean, Coral Bean	*Erythrina herbacea*	
Cherry	*Prunus americana*	
Cherry-laurel	*Prunus caroliniana*	
Chinaberry	*Melia azedarach*	E
Chinese Privet	*Ligustrum sinense*	I,E
Chinese Tallow Tree	*Sapium sebiferum*	I,E
Chinese Wisteria	*Wisteria sinensis*	I,E

Chinquapin	*Castanea pumila*	
Cinnamon Fern	*Osmunda cinnamomea*	
Citrus	*Citrus* sp.	E
Clearweed	*Pilea pumila*	
Climbing Buckthorn	*Sageretia minutiflora*	Uncommon
Climbing Fern	*Lygodium japonicum*	I,E
Climbing Hempweed	*Mikania scandens*	
Climbing hydrangea	*Decumaria barbara*	
Clubpod Stargrass	*Hypoxis leptocarpa*	
Coastal Plain Willow	*Salix caroliniana*	
Coco Plum	*Crysobalanus icaco*	
Cogon Grass	*Imperata cylindrica*	
Coinwort	*Centella asiatica*	
Common Arrowhead	*Sagittaria latifolia*	
Common Cattail	*Typha latifolia*	
Common Dandelion	*Taraxacum officinale*	E
Common Persimmon	*Diospyros virginiana*	
Common Pigweed	*Amaranthus hybridus*	
Common Ragweed	*Ambrosia artemesiifolia*	
Common Sow-Thistle	*Sonchus oleraceus*	
Confederate Jasmine	*Trachelospermum jasminoides*	E
Coontail	*Ceratophyllum demersum*	
Coral Ardisia	*Ardisia crenata*	I,E
Coral Fungi	*Claveria* sp.	
Coral Honeysuckle	*Lonicera sempervirens*	
Coral Vine	*Antigonon leptopus*	E
Crabgrass	*Digitaria* sp.	
Crane-Fly Orchid	*Tipularia discolor*	T4;T6
Crape Myrtle	*Lagerstroemia indica*	E
Creeping Eryngo	*Eryngium baldwinii*	
Creeping Indigo	*Indigofera spicata*	E
Cress	*Cardamine parviflora*	
Cross Vine	*Bignonia capreolata*	
Curly Dock	*Rumex crispus*	
Cut-Leaved Primrose	*Oenothera laciniata*	
Cutleaf Morning Glory	*Merremia dissecta*	
Cylindric Sedge	*Cyperus retrosus*	
Dahoon	*Ilex cassine*	
Daisy Fleabane	*Erigeron strigosus*	
Dangleberry	*Gaylussacia nana*	
Dangleberry	*Gaylussacia tomentosa*	
Darrow's Blueberry	*Vaccinium darowii*	
Day Lilly	*Hemerocallis arenicola*	E
Dayflower	*Commelina virginica*	
Deermoss (Lichen)	*Cladina sp*	
Deermoss (Lichen)	*Cladonia* sp.	

Devil's Walking Stick	*Aralia spinosa*	
Dewberry	*Rubus trivialis*	
Diamond-leaf Oak, Laurel Oak	*Quercus laurifolia*	
Diodia, Buttonweed	*Diodia virginiana*	
Dodder	*Cuscuta compacta*	
Dog Fennel	*Eupatorium capillifolium*	
Dotted Smartweed	*Polygonum punctatum*	
Downy Shield Fern	*Thelypteris dentata*	T4
Duckweed	*Lemna minor*	
Duckweed	*Lemna obscura*	
Duckweed	*Lemna valdiviana*	
Duckweed	*Spirodela punctata*	
Dwarf Dandelion	*Krigia virginica*	
Ebony Spleenwort	*Asplenium platyneuron*	T4
Elderberry	*Sambucus canadensis*	
Elephant Ear	*Xanthosoma sagittifolium*	E
Elephant's Foot	*Elephantopus carolinianus*	
Elephant's Foot	*Elephantopus tomentosus*	
Eliott's Rush	*Juncus elliottii*	
Elliott's Aster	*Aster elliottii*	
English Ivy	*Hedera helix*	I,E
English Plantain, White-Man's Footsteps	*Plantago lanceolata*	E
Evening Primrose	*Oenothera biennis*	
Fairy Footprints	*Hedyotis uniflora*	
Falling Beakrush	*Rhynchospora caduca*	
False Nettle	*Boehmeria cylindrica*	
Fanwort	*Cabomba caroliniana*	
Fetterbush	*Lyonia lucida*	
Fingergrass	*Eustachys petrea*	
Flag	*Iris* sp.	
Flat Sedge	*Cyperus* sp. *1*	
Flat Sedge	*Cyperus* sp. *2*	
Flat Sedge	*Cyperus* sp. *3*	
Flatwood Plum	*Prunus umbellata*	
Florida Elephant's Foot	*Elephantopus elatus*	
Florida Maple	*Acer saccharum ssp. floridanum*	
Florida Soapberry	*Sapindus saponaria*	Uncommon
Florida Violet	*Viola floridana*	
Flowering Dogwood	*Cornus florida*	
Forked Panicum	*Panicum dichotomum*	
Frog's Bit	*Limnobium spongia*	
Frost Grape	*Vitis vulpina*	
Frost Weed	*Verbesina virginica*	
Giant Cane	*Arundinaria gigantea*	
Globe Sedge	*Cyperus globulosus*	

Glossy Privet	*Ligustrum lucidum*	I,E
Godfrey's Privet	*Forestiera godfreyi*	Rare
Goldenrod	*Solidago canadensis*	
Goldenrod	*Solidago laevenworthii*	
Gooseberry	*Ribes* sp.	
Goosegrass	*Eluesine indica*	E
Gopher Apple	*Licania michauxii*	
Grape	*Vitis* sp.	
Grass-Leaf Golden Aster	*Pityopsis graminifolia*	
Green Ash	*Fraxinus pennsylvanica*	
Green Briar	*Smilax auriculata*	
Green Briar	*Smilax bona-nox*	
Green Briar	*Smilax rotundifolia*	
Green Briar	*Smilax* sp.	
Green Dragon	*Arisaema dracontium*	
Green-Eyes	*Berlandiera subacaulis*	
Greenfly Orchid	*Epidendrum conopseum*	T4,T6
Ground Cherry	*Physalis carpenteri*	Rare
Groundsel Tree	*Baccharis glomeruliflora*	
Guinea Grass	*Panicum maximum*	E
Guinea-hen Weed	*Petiveria alliacea*	
Gum Bumelia	*Bumelia lanuginosa*	
Hair Sedge	*Bulbostylis* sp.	
Hairy Indigo	*Indigofera hirsuta*	E
Hairy Panicum	*Panicum anceps*	
Hairy Spurge	*Chamaesyce hirta*	
Hairy Thoroughwort	*Eupatorium pilosum*	
Hammock Privet	*Forestiera ligustrina*	
Haw, Arrow Wood	*Viburnum dentatum*	
Hawk's-beard	*Hieracium gronovii*	
Hawthorne	*Crataegus* sp.	
Hearts -a'- Bustin	*Euonymous americanus*	
Hedge Bamboo	*Bambusa multiplex*	E
Hedge Nettle, Florida Betony	*Stachys floridana*	
Hercules Club	*Zanthoxylum clava-herculis*	
Hidden Dropseed	*Sporobolis clandestinus*	
Highbush Blackberry	*Rubus argutus*	
Highbush blueberry	*Vaccinium corymbosum*	
Hophornbeam; Ironwood	*Ostrya virginiana*	
Hoptree,	*Ptelia trifoliata*	
Hornwort	*Phaeoceros* sp.	
Horsemint	*Monarda punctata*	
Hyssop-Leaf Spurge, Eyebane	*Chamaesyce hyssopifolia*	
Indian Paintbrush	*Carphephorus corymbosus*	
Indian Pipe	*Monotropa uniflora*	
Indigo	*Ipomoea hederacea*	E

Inkberry, Gallbery	*Ilex glabra*	
Innocence	*Hedyotis procumbens*	
Iron Weed	*Vernonia gigantea*	
Iron Weed	*Vernonia* sp.	
Jack-in-the-pulpit	*Arisaema triphyllum*	
Jackson Vine	*Smilax smallii*	T3
Japanese Paper Mulberry	*Broussonetia papyrifera*	
Japanese Privet	*Ligustrum japonicum*	I,E
Johnson Grass	*Sorghum halapense*	E
Jumpseed	*Polygonum virginianum*	Uncommon
Knotroot Foxtail	*Setaria geniculata*	
Knotweed	*Polygonum pensylvanicum*	
Knotweed	*Polygonum* sp.	
Ladies' Tresses	*Spiranthes cernua*	T4
Lady's Sorrel	*Oxalis corniculata*	
Lantana	*Lantana camara*	
Late Thoroughwort	*Eupatorium serotinum*	
Laurel Oak	*Quercus hemisphaerica*	
Leather Flower	*Clematis crispa*	
Little Blue Maidencane, Goober Grass	*Amphicarpum muhlenbergianum*	
Little Blue-stem Palm	*Sabal minor*	T4
Live Oak	*Quercus virginiana*	
Liverwort	*Dumortiera* sp.	
Lizard's Tail	*Saururus cernuus*	
Loblolly Pine	*Pinus taeda*	
Longleaf Pine	*Pinus palustris*	
Longleaf Spike-grass	*Chasmanthium sessiliflorum*	
Loquat	*Eriobotrya japonica*	E
Maidencane	*Panicum hemitomon*	
Manroot; Wild Potato Vine	*Ipomoea pandurata*	
Marsh Pennywort	*Hydrocotyle umbellata*	
Maypop, Passion Flower	*Passiflora incarnata*	
Meadow Beauty	*Rhexia* sp.	
Meadow Spike Moss	*Selaginella apoda*	T4
Mexican Clover	*Richardia scabra*	
Mexican Tea	*Chenopodium ambrosioides*	
Mexican Wild Petunia	*Ruellia brittoniana*	E
Milk Pea	*Galactia mollis*	
Milk Pea	*Galactia volubilis*	
Milkweed Vine	*Cynanchum scoparium*	
Millet Beakrush	*Rhynchospora miliacea*	
Mimosa	*Albizia julibrissin*	I,E
Mistletoe	*Phoradendron serotinum*	
Mockernut Hickory	*Carya tomentosa*	
Monkey Grass	*Loriope spicata*	
Morning Glory	*Ipomoea* sp.	

Mosquito Fern	*Azolla caroliniana*	
Moss	*Climacium americanum*	
Moss	*Eutodon seductrix*	
Moss	*Hypnum lindbergii*	
Moss	*Mnium cuspidatum*	
Narrowleaf Pawpaw	*Asimina angustifolia*	
Needle Palm	*Rhaphidophyllum hystrix*	T3
Netted Chain Fern	*Woodwardia areolata*	T4
Nightshade	*Solanum americanum*	
Northern Bayberry	*Myrica heterophylla*	
Nut Sedge	*Scleria* sp.	
Oak-Leaf Fleabane	*Erigeron quercifolius*	
Old-man's-Beard, Fringe Tree	*Chionanthus virginicus*	
One-flowered Haw	*Crataegus uniflora*	
Painted Leaf	*Poinsettia cyathophora*	
Pale Meadow Beauty	*Rhexia mariana*	
Parrot's Feather	*Myriophyllum aquaticum*	E
Parsley Haw	*Crataegus marshallii*	
Partridge Berry	*Mitchella repens*	
Partridge Pea	*Chamaecrista fasciculata*	
Partridge Pea, Sensitive Plant	*Chamaecrista nictitans*	
Pawpaw, Small-fruited Pawpaw	*Asimina parviflora*	
Pawpaw	*Asimina* sp.	
Pellitory	*Parietaria praetermissa*	
Pennywort	*Hydrocotyle ranunculoides*	
Pennywort	*Hydrocotyle* sp.	
Pepper Grass	*Lepidium virginicum*	
Peppervine	*Ampelopsis arborea*	
Perennial Sandgrass	*Triplasis americana*	
Phlox	*Phlox drummondii*	
Pickerelweed	*Pontederia cordata*	
Pignut Hickory	*Carya glabra*	
Pinelands Yellow Stargrass	*Hypoxis micrantha*	
Pinweed	*Lechia* sp.	
Plantain	*Plantago major*	E
Podocarpus	*Podocarpus macrophylla*	E
Poison Ivy	*Toxicodendron radicans*	
Poison Oak	*Toxicodendron toxicarium*	
Pokeweed	*Phytollaca americana*	
Polecat Geranium	*Geranium carolinianaum*	
Pond Pine	*Pinus serotina*	
Pony Foot	*Dichondra carolinensis*	
Poor Joe	*Diodia teres*	
Post Oak	*Quercus stellata*	
Prickly Pear	*Opuntia humifusa*	
Primrose Willow	*Ludwigia decurrens*	

Primrose Willow	*Ludwigia octovalvis*	
Primrose Willow	*Ludwigia peruviana*	I
Privet	*Forestiera acuminata*	
Puckroot	*Psoralea* sp.	Rare
Pumpkin Ash	*Fraxinus profunda*	
Purple Lovegrass	*Eragrostis spectabilis*	
Rabbit-Bells	*Crotalaria rotundifolia*	
Rattan Vine	*Berchemia scandens*	
Rattlebox, Lance-Leaf Rattlebox	*Crotalaria lanceolata*	
Rattlebox	*Crotalaria pallida*	
Rattlebox	*Crotalaria* sp.	
Red Bay	*Persea borbonia*	
Red Buckeye	*Aesculus pavia*	
Red Maple	*Acer rubrum*	
Red Mulberry	*Morus rubra*	
Red Spiderling, Wine-flower	*Boerhavia diffusa*	
Redbud	*Cercis canadensis*	
Rescuegrass	*Bromus cf. unioloides*	
Resurrection Fern	*Polypodium polypodiodes*	
Rockrose	*Helianthemum arenicola*	
Rockrose	*Helianthemum* sp.	
Rouge Plant	*Rivina humilis*	
Royal Fern	*Osmunda regalis*	
Runner Oak	*Quercus pumila*	
Rush	*Juncus coriaceus*	
Rush	*Juncus megacephalus*	
Rush	*Juncus* sp.	
Rusty Blackhaw	*Viburnum rufidulum*	
Rusty Lyonia	*Lyonia ferruginea*	
Ryegrass	*Lolium perenne*	
Saltbush	*Baccharis halimifolia*	
Sand Blackberry	*Rubus cuneifolius*	
Sand Pine	*Pinus clausa*	
Sand-live Oak	*Quercus geminata*	
Sarsparilla Vine	*Smilax pumila*	
Sassafras	*Sassafras albidum*	
Satin Curls	*Clematis catesbyana*	Rare, 2
Saw Palmetto	*Serenoa repens*	
Scirpus Rush	*Juncus scirpoides*	
Scratch Daisy	*Haplopappus divaricata*	
Scuppernong, muscadine	*Vitis rotundifolia*	
Sebastian Bush	*Sebastiania fruticosa*	Uncommon
Sedge	*Carex alata*	
Sedge	*Carex amphibola*	
Sedge	*Carex comosa*	
Sedge	*Carex crinita*	

Sedge	*Carex fissa* var. *aristata*	
Sedge	*Carex folliculata*	
Sedge	*Carex intumescens*	
Sedge	*Carex lupulina*	
Sedge	*Carex* sp.	
Sedge	*Carex* sp. *1*	
Sedge	*Carex* sp. *2*	
Sedge	*Carex* sp. *3*	
Sedge	*Carex stipata*	
Sedge	*Cyperus strigosus*	
Sedge	*Cyperus tetragonus*	
Seven-Lobed Violet	*Viola septemloba*	
Shaggy Crabgrass	*Digitaria villosa*	
Shield Fern	*Thelypteris* sp.	T4
Shortspike Bluestem	*Andropogon brachystachyus*	
Showy Pawpaw, Flag Pawpaw, Polecat Bush	*Asimina incarna*	
Showy Rattlebox	*Crotalaria spectabilis*	
Shumard Oak	*Quercus shumardii*	
Slash Pine	*Pinus elliotii*	
Smartweed, Water Pepper	*Polygonum hydropiperoides*	
Soft Rush	*Juncus effusus*	
Solomon's Seal	*Polygonatum biflorum*	
Sour Gum, Tupelo	*Nyssa sylvatica*	
Sour Gum, Black Gum	*Nyssa sylvatica* var. *biflora*	
Southern Cutgrass	*Leersia hexandra*	
Southern Gaura	*Guara angustifolia*	
Southern Plantain	*Plantago virginica*	
Southern Red Cedar	*Juniperus silicicola*	
Southern Red Oak	*Quercus falcata*	
Southern Sandspur	*Cenchrus echinatus*	
Southern Water Hemp	*Amaranthus australis*	
Southern Wild Rice	*Zizaniopsis miliacea*	
Spanish Moss	*Tillandsia usneoides*	
Sparkleberry	*Vaccinium arboreum*	
Spatter-Dock	*Nuphar luteum*	
Spider Lilly	*Hymenocallis rotata*	
Spiderling	*Boerhavia erecta*	
Spiderwort	*Tradescantia ohiensis*	
Spike Moss	*Selaginella ludoviciana*	T4
Spikerush	*Eleocharis* sp.	
Spiny-leaved Sow-Thistle	*Sonchus asper*	
Splitbeard Bluestem	*Andropogon ternarius*	
Spruce Pine	*Pinus glabra*	
St. Andrews Wort	*Hypericum hypericoides*	
St. Augustine Grass	*Stenotapharum secundatum*	

St. John's Wort	*Hypericum* sp.	
Stargrass	*Hypoxis rigida*	
Sticktights	*Desmodium incanum*	
Sticky Dog Fennel, Yankee Weed	*Eupatorium compositifolium*	
Stiff Dogwood	*Cornus foemina*	
Sugar Cane Plumegrass	*Erianthus giganteus*	
Sugarberry	*Celtis laevigata*	
Summer Farewell	*Dalea* sp.	
Summer Grape	*Vitis aestivalis*	
Summer Haw	*Crataegus flava*	
Swamp Bay	*Persea palustris*	
Swamp Chestnut Oak	*Quercus michauxii*	
Swamp Mallow	*Hibiscus moschueteus*	
Swamp Rose	*Rosa palustris*	
Sweetbay	*Magnolia virginiana*	
Sweetgum	*Liquidambar styraciflua*	
Sweetleaf, Horse Sugar	*Symplocos tinctoria*	
Tall Redtop	*Tridens flavus*	
Tansy Mustard	*Descurainia pinnata*	
Tea Weed, Indian hemp	*Sida rhombifolia*	
Thistle	*Cirsium horridulum*	
Thoroughwort	*Eupatorium mohrii*	
Thoroughwort	*Eupatorium* sp.	
Three-Awn Grass	*Aristida* sp.	
Three-way Sedge	*Dulichium arundinaceum*	
Toadflax	*Linaria canadensis*	
Torpedo Grass	*Panicum repens*	I,E
Tread Softly	*Cnidoscolus stimulosus*	
Trumpet Vine	*Campsis radicans*	
Tung Tree	*Aleurites fordii*	E
Turkey Oak	*Quercus laevis*	
Valerian	*Valeriana scandens*	
Variable Panicum	*Panicum commutatum*	
Verbena, Moss Verbena	*Glandularia pulchella*	E
Violet	*Viola esculenta*	
Violet	*Viola* sp.	
Violet	*Viola* sp.*1*	
Violet	*Viola* sp.*2*	
Violet Wood Sorrel	*Oxalis corymbosa*	
Virgin's Bower	*Clematis terniflora*	E
Virgin's Bower	*Clematis virginiana*	
Virginia Chain Fern	*Woodwardia virginica*	
Virginia Creeper	*Parthenocissus quinquifolia*	
Virginia-Willow	*Itea virginica*	
Wake Robbin, Toad Trillium	*Trillium maculatum*	Rare in Co.
Walter Haw	*Viburnum obovatum*	

Walter's Violet	*Viola walteri*	
Wandering Jew	*Tradescantia fluminensis*	I,E
Water Ash	*Fraxinus caroliniana*	
Water Elm, Planer Tree	*Planera aquatica*	
Water Hemlock	*Cicuta mexicana*	
Water Hickory	*Carya aquatica*	
Water Hyacinth	*Eichhornia crassipes*	I,E
Water Meal	*Wolffia columbiana*	
Water Oak	*Quercus nigra*	
Water Shields	*Brasenia shreberi*	
Water Spangles	*Salvinia minima*	
Water Willow	*Justicia americana*	
Water-Cress	*Nasturtium cf. officinale*	E
Wax Begonia	*Begonia cucullata*	I,E
Wax Myrtle	*Myrica cerifera*	
Whip Nut Rush	*Scleria triglomerata*	
White Ash	*Fraxinus americana*	
White Clover	*Trifolium repens*	
White Mulberry	*Morus alba*	E
White Oak	*Quercus alba*	Uncommon
Whitegrass	*Leersia virginica*	
Whorled pennywort	*Hydrocotyle verticillata*	
Wild Azalea	*Rhododendron canescens*	
Wild Buckwheat	*Eriogonum tomentosum*	
Wild Chervil	*Chaerophyllum tainturieri*	
Wild Cucumber	*Melothria pendula*	
Wild Onion	*Allium canadense*	
Wild Petunia	*Ruellia caroliniensis*	
Wild Pine	*Tillandsia bartramii*	T4
Wild Sarsparilla	*Smilax glauca*	
Wild Taro	*Colocasia esculentum*	I,E
Wild Yam	*Dioscorea floridana*	
Wild Yam	*Dioscorea quaternata*	
Willow Oak	*Quercus phellos*	
Winged Elm	*Ulmus alata*	
Winged Sumac	*Rhus copallina*	
Wiregrass, Pineland 3-awn	*Aristida stricta*	
Wireweed	*Polygonella gracilis*	
Wisteria	*Wisteria* sp.	
Witch Hazel	*Hamamelis virginiana*	Uncommon
Wood Fern	*Thelypteris kunthii*	T4
Wood Sage	*Teucrium canadense*	
Wood Sorrel	*Oxalis* sp.	
Wood-Lettuce	*Lactuca floridana*	
Yaupon	*Ilex vomitoria*	
Yellow Buttons	*Balduina angustifolia*	

Yellow Jessamine	*Gelsemium sempervirens*	
Yellow Passion Flower	*Passiflora lutea*	
Yellow Wood Sorrel	*Oxalis stricta*	
Yellow-Eyed Grass	*Xyris* sp.	
Common names not known:	*Acmella* sp.	
	Bumelia anomala	
	Calystegia sepium	
	Chenopodium giganteum	
	Croton trinitatus	
	Elaeagnus canadensis	
	Gaylussacia alba	
	Geastrum sp.	
	Ipomoea cordatotriloba	
	Ludwigia cf. palustris	
	Melanthera nivea	
	Modiola caroliniana	
	Osmunda intermedia	
	Panicum angustifolium	
	Panicum laxiflorum	
	Polygonum densiflorum	
	Rhynchospora colorata	
	Rhynchospora divergens	
	Rhyncosia sp.	
	Rumex hastatulus	
	Sida cordifolia	E
	Sisyrinchium rosulatum	
	Thunbergia alata	
	Verbena bonariensis	E
	Verbena hastata	
	Viburnum dentatum var. *scabrellum*	
	Youngia japonica	E

APPENDIX II

MAMMALS OF THE HOGTOWN CREEK DRAINAGE BASIN

SCIENTIFIC NAME	COMMON NAME	LOCATION	STATUS	SOURCE
Blarina brevicauda	short-tailed shrew		C	WTI
Cryptotis parva	least shrew			FLMNH
Dasypus novemcinctus	armadillo	DF,PR	C	WTI
Didelphis marsupialis	opossum	DF,SF,U	C	WTI
Glaucomys volans	southern flying squirrel	DF,SF	C	WTI
Geomys pinetis	pocket gopher	SH		WTI
Lasiurus borealis	red bat	DF, U, P		WTI
Lasiurus intermedius	eastern yellow bat	DF, P, caves		FLMNH
Lasiurus seminolus	seminole bat	DF, P, caves		FLMNH
Microtis pinetorum	pine vole	PL		WTI
Lutra canadensis	river otter	P,R	R, SC	FLMNH
Mephitis mephitis	striped skunk	PR, DF		WTI
Mustela frenata	long-tailed weasel	DF,PR		FLMNH
Myotis austroriparius	mississippi myotis			FLMNH
Neofiber alleni	florida water rat	SF, P, R	SC	FLMNH
Neotoma floridana	eastern woodrat	DF,SF,PR		WTI
Oryzomys palustris	rice rat	General, PR		FLMNH
Peromyscus floridanus	florida mouse	General, PR	T	FLMNH
Peromyscus gossypinus	cotton mouse	General, PR		FMNH
Peromyscus polionotus	old field mouse	General, PR		FMNH
Ochrotomys nuttalli	golden mouse	General, PR	E	FLMNH
Procyon lotor	raccoon	DF,SF,R,U	C	WTI
Reithrodontomys humulis	eastern harvest mouse	General, PR		FLMNH
Scalopus aquaticus	eastern mole	General, PR	C	FMNH
Sciurus carolinensis	grey squirrel	DF,U	C	WTI
Sigmodon hispidus	hispid cotton rat	SF		FLMNH
Silvilagus floridanus	eastern cottontail	DF,PR,P	C	WTI
Silvilagus palustris	marsh rabbit	SF,PR	C	WTI
Spilogale putorius	spotted skunk	DF, SF, R		WTI
Sus scrofa	feral pig	DF,SF	R	WTI
Tadarida brasiliensis	mexican free-tailed bat	DF, U, P	C	WTI
Urocyon cinereoargenteus	gray fox	DF, SF		FMNH
Vulpes vulpes	red fox	DF, U, PR		WTI
Ondatia zibethicus	muskrat	Possible		WTI
Odocoileus virginianus	white-tailed deer	Possible		WTI

Key to Abbreviations

Location

DF	Dry Forest: includes mesic hammock, but no standing water
SF	Swamp Forest: includes hardwood hammocks and scrub with swamp
U	Urban areas
PR	Prairie, with occasional ponding
P	pond or standing pool
R	flowing river or stream
PL	Pineland
SH	Sand Hill

Status

C	common in this area
T	threatened species (listed in Florida)
R	rare or occasional in this area
E	endangered species (listed in Florida)
SC	species of special concern
B	breeding
M	migratory: in this area less than 6 months/year

Source

WTI:	Wild Things, Inc., through field work and personal communications.
FLMNH:	Florida Museum Natural History: info. from Mammal Range Collection, Dr. Steve Humphrey, or Dr. John F. Eisenberg.

Prepared for Wild Things, Inc. by Thia Hunter, Dept. of Zoology, 223 Bartram Hall, UF

APPENDIX III

PRELIMINARY LIST OF BIRDS OF THE HOGTOWN CREEK DRAINAGE BASIN

COMMON NAME	SCIENTIFIC NAME	STATUS
acadian flycatcher	*Empidonax virescens*	B
american bittern	*Botaurus lentiginosus*	
american coot	*Fulica americana*	
american crow	*Corvus brachyrhynchos*	C
american goldfinch	*Carduelis tristus*	
american kestrel	*Falco sparverius*	
american pipit	*Anthus spinoletta*	
american redstart	*Setophaga ruticilla*	
american robin	*Turdus migratorius*	C
american wigeon	*Anas americana*	
american woodcock	*Scolopax minor*	
anhinga	*Anhinga anhinga*	
bald eagle	*Haliaeetus leucocephalus*	E
barred owl	*Strix varia*	C B N
belted kingfisher	*Ceryle alcyon*	
black & white warbler	*Mniotilta varia*	M
black vulture	*Coragyps atratus*	
black-throated blue warbler	*Dendroica caerulescens*	M
blue jay	*Cyanocitta cristata*	C B
blue-grey gnatcatcher	*Polioptila caerulea*	
blue-winged teal	*Anas discors*	
boat-tailed grackle	*Quiscalus major*	
bonaparte's gull	*Larus philadelphia*	
brewer's blackbird	*Euphagus cyanocephalus*	
broad-winged hawk	*Buteo platypterus*	
brown creeper	*Certhia americana*	M
brown thrasher	*Toxostoma rufum*	
carolina chicadee	*Parus carolinensis*	C
carolina wren	*Thryothorus ludovicianus*	B N
cattle egret	*Bubulcus ibis*	C B
cedar waxwing	*Bombycilla cedrorum*	
common grackle	*Quiscalus quiscula*	C
common moorhen	*Gallinula chloropus*	
common nighthawk	*Chordeiles minor*	B
common snipe	*Gallinago gallinago*	
common yellowthroat	*Geothlypis trichas*	
cooper's hawk	*Accipiter cooperi*	
double-crested cormorant	*Phalacrocorax auritus*	
downy woodpecker	*Picoides pubescens*	C B N

eastern phoebe	*Sayornis phoebe*	M
fish crow	*Corvus ossifragus*	
forster's tern	*Sterna forsteri*	
gadwall	*Anas strepira*	M
glossy ibis	*Plegadis falcinellus*	
golden-crowned kinglet	*Regulus satrapa*	
gray catbird	*Dumetella carolinensis*	
great blue heron	*Ardea herodias*	C
great crested flycatcher	*Myiarchus crinitus*	
great horned owl	*Bubo virginianus*	
greater yellowlegs	*Tringa melanoleuca*	
green-backed heron	*Butorides striatus*	
green-winged teal	*Anas crecca*	
hermit thrush	*Catharus guttatus*	C M
hooded warbler	*Wilsonia citrina*	
house wren	*Troglodytes aedon*	M
killdeer	*Charadrius vociferus*	
least bittern	*Ixobrychus exilis*	
limpkin	*Aramus guarauna*	
little blue heron	*Florida caerulea*	
loggerhead shrike	*Lanius ludovicianus*	
mallard	*Anas platyrhinchos*	M
marsh wren	*Cistothorus palustris*	M
mississippi kite	*Ictinia mississippiensis*	R
mottled duck	*Anas fulvigula*	SC
mourning dove	*Zenaida macroura*	C B
northern cardinal	*Cardinalis cardinalis*	C M
northern flicker	*Colaptes auratus*	N
northern harrier	*Circus cyaneus*	
northern mockingbird	*Mimus polyglottus*	C B N
northern parula warbler	*Parula americana*	B
northern pintail	*Anas acuta*	
northern shoveler	*Anas clypeata*	
orange-crowned warbler	*Verminvora celata*	
osprey	*Pandion haliaetus*	C B N
ovenbird	*Seiurus aurocapillus*	C B
palm warbler	*Dendroica palmarum*	
pied-billed grebe	*Podilymbus podiceps*	
pileated woodpecker	*Dryocopus pileatus*	N
pine warbler	*Dendroica pinus*	
prothonotary warbler	*Protonotaria citrea*	B
purple finch	*Carpodacus cassinii*	C
purple gallinule	*Porphyrula martinica*	C
red-bellied woodpecker	*Melanerpes carolinus*	C N
red-eyed vireo	*Vireo olivacius*	C
red-shouldered hawk	*Buteo lineatus*	

red-tailed hawk	*Buteo jamaicensis*	
red-winged blackbird	*Agelaius phoeniceus*	C
ring-billed gull	*Larus delawarensis*	
ring-necked duck	*Aythya collaris*	
ruby-crowned kinglet	*Regulus calendula*	
ruby-throated hummingbird	*Archilochus colubris*	B
rufous-sided towhee	*Pipilo erythrophthalmus*	
sandhill crane	*Grus canadensis*	T
savannah sparrow	*Passerculus sandwichensis*	
screech owl	*Otus asio*	
sedge wren	*Cistothorus platensis*	
sharp-shinned hawk	*Accipiter striatus*	
snowy egret	*Egretta thula*	C B
solitary vireo	*Vireo solitarius*	
song sparrow	*Melospiza melodia*	
summer tanager	*Piranga rubra*	
swamp sparrow	*Melospiza georgiana*	
tree swallow	*Tachycineta bicolor*	
tricolor heron	*Hydranassa tricolor*	
tufted titmouse	*Parus bicolor*	
turkey vulture	*Cathartes aura*	C B
white ibis	*Eudocimus albus*	B N
white-eyed vireo	*Vireo griseus*	C
white-throated sparrow	*Zonotrichia leucophyrs*	C M
wild turkey	*Meleagris gallopavo*	
winter wren	*Troglodytes troglodytes*	M
wood duck	*Aix sponsa*	
wood stork	*Mycteria americana*	E
worm-eating warbler	*Helmintheros vermivorus*	
yellow billed cuckoo	*Coccyzus americanus*	
yellow-bellied sapsucker	*Sphyrapicus varius*	M
yellow-rumped warbler	*Dendroica coronata*	M
yellow-throat warbler	*Dendroica dominica*	
yellow-throated vireo	*Vireo flavifrons*	

Key to STATUS abbreviations:

B=Breeding M=Migratory, in this area less than 6 months/year
E=Endangered N=Nesting SC=Species of Special Concern
T=Threatened C=Common R=Rare

Prepared by Thia Hunter, with revisions by Peter Polshek and Peter Alcorn. Additional birds were provided by Tom Webber.

APPENDIX IV

HERPETOFAUNA OF THE HOGTOWN CREEK DRAINAGE AND KANAPAHA LAKE REGION

SCIENTIFIC NAME	COMMON NAME	STATUS	SOURCE
Amphibians			
Frogs and Toads			
Bufo quercicus	oak toad		RF
B. terrestris	southern toad		HRFMNH, CLC
Acris gryllus dorsalis	florida cricket frog		HRFMNH
Hyla chrysoscelis	cope's gray treefrog		HRFMNH
H. cinerea	green treefrog		HRFMNH
H. femoralis	pinewoods treefrog		RF
H. gratiosa	barking treefrog		RF
H. squirella	squirrel treefrog		HRFMNH
Pseudacris crucifer bartramiana	southern spring peeper		HRFMNH
P. nigrita verrucosa	florida chorus frog		HRFMNH
P. ocularis	little grass frog		RF
P. ornata	ornate chorus frog		RF
Eleuthero-dactylus p. planirostris	greenhouse frog		HRFMNH
Gastrophryne carolinensis	eastern narrow- mouth toad		HRFMNH
Scaphiopus h. holbrookii	eastern spadefoot toad		HRFMNH, CLC
Rana capito aesopus	florida gopher frog	SC, PL	RF
R. catesbeiana	bullfrog		
R. c. clamitans	bronze frog		HRFMNH
R. grylio	pig frog		HRFMNH
R. utricularia	southern leopard frog		HRFMNH
Salamanders			
Ambystoma talpoideum	mole salamander		RF
A. t. tigrinum	eastern tiger salamander	Unique Occurrence	RF
Amphiuma means	two-toed amphiuma		HRFMNH
Desmognathus auriculatus	southern dusky salamander		RF
Eurycea quadridigitata	dwarf salamander		HRFMNH
Plethodon grobmani	southeastern slimy salamander		RF
Pseudotriton montanus floridanus	rusty mud salamander	Unique sp., Occurrence	HRFMNH
Notophthalmus perstriatus	striped newt	PL	HRFMNH
N. viridescens piaropicola	peninsula newt		HRFMNH
Pseudobranchus axanthus	narrow-striped dwarf siren		HRFMNH
Siren i. intermedia	eastern lesser siren		RF
S. lacertina	greater siren		HRFMNH

Reptiles			
Alligator			
Alligator mississippi-ensis	american alligator	SC, RG	HRFMNH
Turtles and Tortoise			
Chelydra serpentina osceola	florida snapping turtle		HRFMNH
Deirochelys reticularia chrysea	florida chicken turtle		HRFMNH
Pseudemys floridana peninsularis	peninsula cooter		HRFMNH
P. nelsoni	florida redbelly turtle		HRFMNH
Terrapene carolina bauri	florida box turtle	RG	HRFMNH, CLC
Trachemys s. scripta	yellowbelly slider		HRFMNH
Kinosternon baurii	striped mud turtle		HRFMNH
K. subrubrum steindachneri	florida mud turtle		RF
Sternotherus m. minor	loggerhead musk turtle	RG	RF
S. odoratus	stinkpot		RF
Gopherus polyphemus	gopher tortoise	SC	HRFMNH
Apalone ferox	florida softshell		HRFMNH
Worm Lizard			
Rhineura floridana	florida worm lizard		HRFMNH
Lizards			
Ophisaurus attenuatus longicaudus	eastern slender glass lizard		CLC
O. ventralis	eastern glass lizard		HRFMNH, CLC
Anolis carolinensis	green anole		HRFMNH, CLC
A. sagrei	brown anole		HRFMNH
Sceloporus u. undulatus	southern fence lizard		HRFMNH
Eumeces egregius onocrepis	peninsula mole skink		HRFMNH
E. fasciatus	five-lined skink		RF
E. inexpectatus	southeastern five-lined skink		RF
E. laticeps	broadhead skink		RF
Scincella lateralis	ground skink		HRFMNH, CLC
Cnemidophorus s. sexlineatus	six-lined racerunner		RF
Non-Poisonous Snakes			
Cemophora c. coccinea	florida scarlet snake		RF
Coluber constrictor priapus	southern black racer		HRFMNH
Diadophis p. punctatus	southern ringneck snake		HRFMNH, CLC
Drymarchon corais couperi	eastern indigo snake	T	RF

Elaphe g. guttata	corn snake		HRFMNH
E. obsoleta quadrivittata	yellow rat snake		HRFMNH
Farancia a. abacura	eastern mud snake		RF
Heterodon platirhinos	eastern hognose snake		HRFMNH
Heterodon simus	southern hognose snake		RF
Lampropeltis getula floridana	florida kingsnake		HRFMNH
L. triangulum elapsoides	scarlet kingsnake		HRFMNH
Masticophis f. flagellum	eastern coachwhip		RF
Nerodia fasciata pictiventris	florida banded water snake		HRFMNH
N. floridana	florida green water snake		RF
N. taxispilota	brown water snake		RF
Opheodrys aestivus	rough green snake		HRFMNH
Pituophis melanoleucus mugitus	florida pine snake	SC	FNAI
Regina alleni	striped crayfish snake		HRFMNH
R. r. rigida	glossy crayfish snake		RF
Rhadinaea flavilata	pine woods snake		HRFMNH, CLC
Seminatrix p. pygaea	north Florida swamp snake		HRFMNH
Stilosoma extenuatum	short-tailed snake	T, Unique species	HRFMNH
Storeria dekayi victa	florida brown snake		HRFMNH
S. occipito-maculata obscura	florida redbelly snake		HRFMNH
Tantilla relicta neilli	central florida crowned snake		HRFMNH
Thamnophis sauritus sackenii	peninsula ribbon snake		HRFMNH
T. s. sirtalis	eastern garter snake		RF
Virginia striatula	rough earth snake		RF
V. v. valeriae	eastern smooth earth snake		RF
Poisonous Snakes			
Micrurus f. fulvius	eastern coral snake		HRFMNH
Agkistrodon piscivorus conanti	florida cottonmouth		HRFMNH
Crotalus adamanteus	eastern diamondback rattlesnake		HRFMNH
Sistrurus miliarius barbouri	dusky pygmy rattlesnake		RF

Key to Symbols:

Status (listed by Florida Game and Fresh Water Fish Commission)

PL = Proposed for Listing
T = Threatened - fully protected
SC = Species of Special Concern - protected except as authorized by regulation
RG = Regulated Species - species which are not fully protected, but for which possession limits and/or seasons may apply

Source

HRFMNH = Herpetology Range, Florida Museum of Natural History
CLC = Capture or visual sighting by Cathi L. Campbell
FNAI = Florida Natural Areas Inventory
RF = Expected species per Richard Franz, Florida Museum of Natural History

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Prepared for Wild Things, Inc. by Cathi Campbell

APPENDIX V

Sugarfoot Fly
Nemopalpus nearcticus Young

This fly is a member of the family Psychodidae (Order Diptera) or sand flies and is the only species of the primitive subfamily Bruchomyiinae found in the Nearctic. Generally, *Nemopalpus nearcticus* is similar in appearance to a small black mosquito (wing length 3.6-3.9 mm) except the mouthparts are small and not suited for bloodsucking. Other members of the Psychodidae are smaller and males have large spines on the styles of the genitalia.

The species only known localities are Sugarfoot Hammock, west of Gainesville and Gulf Hammock in Levy County. The adults rest during the day in tree holes and crevices in the bark of large trees. Sweetgum, *Liquidambar styraciflua* L., hophornbeam, *Ostrya virginiana* K. Koch, sugarberry, *Celtis laevigata* Willd., oak, *Quercus prinus L.*, and red bay, *Persea borbonia* Spreng. are the dominant trees in the Gainesville site. Adults are active from June through October during the wettest time of year and are most common during September.

Very little is known about the larvae in the field. In the lab, egg to adult development takes about 60 days. The larvae are fed a feces/Purina lab chow diet. Freida Mahmood and Bruce Alexander have a description of the larvae in press.

This is a very unique fly with a very limited distribution in North America. Efforts should be made to prevent the loss of the known populations due to habitat loss or development.

For further reading see:

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Prepared by John Amoroso

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APPENDIX
B

HOGTOWN CREEK GREENWAY

FLORIDA COMMUNITIES TRUST
ANNUAL REPORTING PROCEDURES

FOR THE

CITY OF GAINESVILLE, FLORIDA
&
ALACHUA COUNTY, FLORIDA

ANNUAL REPORTING PROCEDURES
FOR THE
HOGTOWN CREEK GREENWAY PROJECT

1. At least four months prior to each anniversary date of final project approval by Florida Communities Trust, the City of Gainesville Department of Cultural and Natural Operations, will convene a meeting of representatives of the agencies and departments responsible for the Hogtown Creek Greenway System, as listed in Table 8 of this Management Plan or as otherwise assigned by the City or County Manager or by agreement between the City and the County.

2. Prior to meeting, each agency or department will review its specific tasks or responsibilities for the Greenway as assigned by the Management Plan or otherwise and will report on its progress in accomplishing those tasks or responsibilities. The report of each agency will consist of: (1) a statement of tasks and responsibilities assigned to that agency, including any timetable for carrying out such tasks or responsibilities; (2) progress made in accomplishing such tasks or responsibilities; (3) reasons for any departures from anticipated accomplishments in terms of timing or manner of performance; (4) recommended modifications to the assigned tasks or responsibilities, including timetable for accomplishing same, based on responses to the preceding items.

3. Following the meeting of responsible departments and agencies, the City of Gainesville Department of Cultural and Nature Operations will prepare a draft annual stewardship report based upon the reports from the participating departments and agencies. The draft report will incorporate information demonstrating that the requirements of Rule 9K-4.013, Florida Administrative Code, are being met, including the following: (1) information confirming that the conditions imposed at the time the award was made are being followed, (2) monitoring of the stewardship and use of the property, and (3) verification that the conditions contained in Rule 9K-4.012, FAC, pertaining to title, acquisition procedures, lease agreements, and transfer of title, are being met.

4. The City of Gainesville Department of Cultural and Nature Operations will provide copies of the draft annual stewardship report to the participating departments and agencies for their comment. Following a period of comment, the Department of Cultural and Natural

Operations will prepare a revised annual stewardship report and provide copies to all participating departments and agencies no later than two months prior to the anniversary date of final project approval by Florida Communities Trust.

5. At the earliest opportunity after its completion and dissemination, the annual stewardship report shall be placed on the agenda at a meeting of the City Commission of the City of Gainesville and at a meeting of the Alachua County Board of County Commissioners for review, modification as necessary, and approval by motion by each governing body.

6. The City of Gainesville Department of Cultural and Nature Operations will transmit a copy of the approved annual stewardship report to Florida Communities Trust prior to the anniversary of the approval date of the Hogtown Creek Greenway Management Plan by FCT.

APPENDIX
C

HOGTOWN CREEK GREENWAY

INTERLOCAL AGREEMENT

BETWEEN THE

CITY OF GAINESVILLE, FLORIDA
&
ALACHUA COUNTY, FLORIDA

INTERLOCAL AGREEMENT

THIS INTERLOCAL AGREEMENT, made and entered into this 5th day of August, A.D., 1993, by and between Alachua County, a charter county and political subdivision of the State of Florida, acting by and through its Board of County Commissioners (County), and the City of Gainesville, a municipal corporation of the State of Florida, acting by and through its City Commission (City):

W I T N E S S E T H:

WHEREAS, the City and the County have jointly authorized the submission of a grant application to the Florida Communities Trust (FCT) for matching funds to acquire certain parcels constituting the Hogtown Creek Greenway; and

WHEREAS, the FCT has awarded conceptual approval for matching funds for the acquisition of parcels making up the Hogtown Creek Greenway; and

WHEREAS, the City and County have jointly entered into a Conceptual Approval Agreement with the FCT, identified as FCT award #91-049-P1A, in order to receive matching funds for the acquisition of the Hogtown Creek Greenway, hereinafter referred to as the Project; and

WHEREAS, the Conceptual Approval Agreement contains certain requirements, including the adoption of an interlocal agreement between the City and County setting out the relationship between the partners and the fiscal and management responsibilities and obligations incurred by each partner for the Project Site;

NOW, THEREFORE, in consideration of the mutual covenants and conditions contained herein, the parties hereto agree as follows:

1. This Agreement is entered into pursuant to the Florida Interlocal Cooperation Act, Section 163.01, Florida Statutes.

2. The City agrees:

a. To fund, construct, operate, manage, and maintain all improvements identified as the responsibility of the City in the Hogtown Creek Greenway Master Development and Management Plan Report dated July 7 and July 26 (Management Plan), as approved by the City on July 12, A.D., 1993, and by the County on July 27, A.D., 1993, a copy of which is attached hereto and incorporated herein by reference, as the same shall be modified from time to time by mutual agreement of the parties hereto or through provision of an annual stewardship report prepared pursuant to the procedures set out in Section 4a of this Agreement.

b. Subject to the limits and provisions of Section 768.28, Florida Statutes, and to the extent of its negligence, to indemnify and hold the County, its officers and employees harmless should any claim, suit or legal action be brought against the City or the County as a result of the construction, operation, management, or maintenance of the improvements by the City on County-owned property. The City agrees to provide any legal defense necessary against such suit or legal action at no cost to the County.

3. The County agrees:

a. To fund the acquisition of tax parcel #06909-000-000, or portion thereof, from the Commercial Hazardous Waste Facilities Tax Fund #1547 in an amount up to $75,000, contingent upon the award of equal or greater match funding by the State of Florida and further contingent upon the use of a portion of said parcel to provide access to the Kanapaha Botanical Garden and to the proposed Greenway, as mapped and described in FCT Application #91-049-P1A and amended by letter from the County dated June 2, 1993.

b. To construct a road running from State Road 24 (Archer Road) through tax parcel #06909-000-000 to Kanapaha Botanical Garden, as shown in concept in Attachment #2 to a letter dated June 2, 1993, from the County to FCT amending FCT Application #91-049-P1A.

c. Upon acquisition of tax parcel #06909-000-000 or portion thereof, to manage said parcel by agreement with a managing entity or otherwise, consistent with the requirements of the Conceptual Approval Agreement #91-049-P1A, as amended, and Rule 9K-4, Florida Administrative Code.

d. To convey to the City an easement across those County-owned lands whereon improvements pertaining to the Project are shown in the Management Plan, as the same may be amended from time to time by mutual agreement of the parties hereto. The easement shall be for as long as such lands shall be used for passive recreational activities open to the public as part of the Project and shall be conveyed prior to issuance of a building permit for construction of said improvements.

e. To perform such other functions or activities as may be assigned as the responsibility of the County in the annual stewardship report prepared pursuant to the procedures set out in Section 4a of this Agreement, in the Management Plan as the same may be amended by mutual agreement of the parties hereto, or by other mutual agreement between the City and the County.

f. Subject to the limits and provisions of Section 768.28, Florida Statutes, and to the extent of its negligence, to indemnify and hold the City, its officers and employees harmless should any claim, suit or legal action be brought against the City

or the County as a result of the acquisition or management of County-owned property by the County. The County agrees to provide any legal defense necessary for such suit or legal action at no cost to the City.

4. The City and County agree:

a. To prepare and submit an annual stewardship report meeting the requirements of Rule 9K-4.013, Florida Administrative Code. The report shall be prepared annually following the procedures contained in the Management Plan and shall be approved by the City and County respectively. The City shall be the lead entity charged with the responsibility of preparing the report; the County shall assist by providing information pertaining to its obligations under the approved Management Plan.

5. This Agreement embodies the whole understanding between the parties. There are no promises, terms, conditions, or obligations other than those contained herein; and this Agreement shall supersede all previous communications, representations or agreements, either verbal or written between the parties hereto.

6. This Agreement may only be amended by a written document approved and signed by both the parties and filed with the Clerk of the Circuit Court of Alachua County, Florida.

7. This Agreement shall take effect upon filing with the Clerk of the Circuit Court of Alachua County, Florida, pursuant to Section 163.01(11), Florida Statutes, or upon final project plan approval by FCT, whichever occurs later.

8. Nothing in this agreement shall be interpreted as a waiver by the City or the County of its sovereign immunity except as provided under Section 768.28, Florida Statutes.

IN WITNESS WHEREOF the parties hereto have caused the execution hereof by their duly authorized officials on the dates stated below.

ALACHUA COUNTY, FLORIDA

By: Leveda Brown Temporary Chair 8/5/93
for Penelope Wheat, Chair
Board of County Commissioners

ATTEST:

J.K. "Buddy" Irby, Clerk
of the Circuit Court

(SEAL)

CITY OF GAINESVILLE

By:
Paul D. White, City Manager

ATTEST:

Deborah Jenkins
Title: Staff Asst.

APPROVED AS TO FORM AND LEGALITY

Alachua County Attorney

APPROVED AS TO FORM AND LEGALITY

City Attorney

UNIVERSITY OF FLORIDA
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